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ENVIRONMENTAL ASSESSMENT BOARD



ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARINGS

VOLUME: 105

DATE: Wednesday, January 22, 1992


BEFORE:

HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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ENVIRONMENTAL ASSESSMENT BOARD
ONTARIO HYDRO DEMAND/SUPPLY PLAN HEARING

IN THE MATTER OF the Environmental Assessment Act,
R.S.O. 1980, c. 140, as amended, and Regulations
thereunder;

AND IN THE MATTER OF an undertaking by Ontario Hydro
consisting of a program in respect of activities
associated with meeting future electricity
requirements in Ontario.

Held on the 5th Floor, 2200
Yonge Street, Toronto, Ontario,
on Wednesday, the 22nd day of January,
1992, commencing at 10:00 a.m.

VOLUME 105

B E F O R E :

THE HON. MR. JUSTICE E. SAUNDERS	Chairman
DR. G. CONNELL	Member
MS. G. PATTERSON	Member

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1 ---Upon commencing at 10:03 a.m.

2 THE REGISTRAR: Please come to order.

3 This hearing is now in session. Please be seated.

4 MRS. FORMUSA: Good morning, Mr.

5 Chairman. Yesterday Dr. Macedo referred to two
6 overheads that were given exhibit numbers 459A and B.
7 Copies were given to Mr. Lucas and more copies are
8 available on the table for the parties.

9 THE CHAIRMAN: Thank you.

10 Mr. Moran?

11 MR. MORAN: Thank you, Mr. Chairman.

12 MARK JAMES HUGGINS,
13 FRANCIS XAVIER MACEDO,
14 CHRISTOPHER ANDREW MILNE BANCROFT-WILSON,
JANE BERNICE TENNYSON,
GIAN VASCOTTO; Resumed.

15 CROSS-EXAMINATION BY MR. MORAN (Cont'd):

16 Q. Good morning, panel.

17 Dr. Macedo, I am going to take you back
18 up to Northern Ontario briefly for a couple of
19 questions. You will agree that - of course I am sure
20 you will, anyway - that a reliable economic supply of
21 materials and labour is necessary for any transmission
22 project. I take it you will agree that Ontario Hydro
23 transmission projects are generally very large
24 projects; aren't they?

25 DR. MACEDO: A. Yes, I agree with that.

1 Q. Would you agree that northern-based
2 enterprises are generally quite small in nature
3 compared to perhaps southern-based enterprises?

4 A. Perhaps Dr. Tennyson is the right
5 person to answer these questions.

6 Q. Dr. Tennyson?

7 DR. TENNYSON: A. What kind of
8 enterprises are you referring to?

9 Q. Business enterprises in general in
10 Northern Ontario tend to be much smaller, don't they,
11 then in Southern Ontario?

12 A. I would suggest it depends on what
13 kind of businesses. I don't consider International
14 Nickel small.

15 Q. True. Maybe if I move to my next
16 question you will see the point that I am trying to get
17 to.

18 What does Ontario Hydro do to ensure that
19 project contracts are at an appropriate scale for
20 suppliers in Northern Ontario?

21 A. I can speak a bit to that and perhaps
22 others can contribute.

23 What we are trying to do at a
24 project-specific level is specifically address that
25 kind of problem. One of the things that has come out

1 through our public consultation on projects is that
2 size of contracts can be a concern. So, we are looking
3 at breaking down the contracts into smaller sizes so
4 that - I get your point - some of the firms in northern
5 Ontario can actually bid on them.

6 In fact, Hydro has got a senior level
7 committee looking now at all our purchasing practices.

8 Q. Would you agree that it might be
9 useful to hold educational seminars or similar kinds of
10 things so that northern enterprises will get a better
11 idea of just exactly what is available for them, for
12 business opportunities?

13 A. In terms of the project that I am
14 working on and others that I am aware of, that's
15 exactly what we are recommending.

16 Part of our strategy in terms of the
17 economic development initiatives was that we had goals
18 that included trying to maximize economic benefits in
19 the North.

20 As you recall, in the Throne speech
21 Ontario Hydro was asked to try and make sure that
22 northerners benefited from projects in the North. And
23 so to that end we have looked at a number of
24 opportunities and constraints, and where there have
25 been constraints tried to identify measures that we

1 could take, one of them is working very closely with
2 economic development officers, another suggestion that
3 we are trying to pursue is the fact that there would be
4 perhaps through contract liaison, you know, letting
5 people know earlier, explaining what the bidding
6 procedures are. So all of that is being addressed on
7 our project-specific studies.

8 Q. Are you able to say --

9 MR. BANCROFT-WILSON: A. If I could add
10 to that. Another example is prequalification of the
11 bidders. So you go through and find bidders that may
12 be interested in doing the types of work you have
13 available, you go through the prequalification process
14 so, again, they know what safety standards and permits
15 and things they need to be able to bid on an Ontario
16 Hydro project, and that helps them get prepared and get
17 into a position to competitively bid.

18 Another thing done recently on some
19 project in the North is splitting the clearly
20 contracts, is an example, into smaller pieces.
21 Obviously, there are kinds of scale, if you can have
22 one big contract you deal with one contractor. But
23 Ontario Hydro has taken the initiative to split them
24 into smaller pieces so that local firms -- contractors
25 can bid on them and handle the work.

1 So. It's somewhat of an increased cost
2 to us but it again ensures that the benefits perhaps go
3 the local people.

4 Q. All of this stuff that you have
5 described, is that basically going to be in place by
6 the time you will be considering the actual
7 construction of the transmission line for the Manitoba
8 Purchase? Are you able to say that?

9 DR. TENNYSON: A. Well, some of them are
10 in place now. As I indicated, we have had meetings on
11 these very points with various groups in the North with
12 various individuals. So, that some of them are in
13 place, others, as I say, we are pursuing. So, I assume
14 they will be.

15 MR. BANCROFT-WILSON: A. There is a
16 committee that has recently been struck to look at
17 Hydro's purchasing policy with respect to enhancing
18 Aboriginal and northern peoples participation in it.
19 So, that whole thing is being reviewed with
20 participation by the supply division who goes out and
21 lets the contracts and the big projects that are
22 contemplated. So it's dealing with the project
23 specifically and Ontario Hydro's purchasing department
24 to come up with policies that will better enable and
25 ensure that benefits do flow through to Northern

1 Ontario.

2 Q. Thank you.

3 The next point I want to move to then is
4 cultural and heritage resources. Dr. Tennyson or
5 perhaps Mr. Bancroft-Wilson, do you agree that cultural
6 and heritage resources basically occur all over
7 Ontario?

8 A. Yes, they do.

9 Q. Are you able to confirm that Ontario
10 Hydro staff are currently working with government staff
11 to develop a protocol on protection of those resources
12 when transmission projects are being planned?

13 A. Yes, one of the environmental and
14 social factors that I listed is heritage aspects. We
15 have been dealing with the Citizenship and Culture
16 right now -- I have to remember, they keep changing
17 their name, but the Minister responsible I believe
18 is -- or is Communication and Culture.

19 Q. I think it is Communications and
20 Culture. MCC.

21 A. The initials stay the same but the
22 name changes. Right now it's Communication and
23 Culture. We have been working with them for the last
24 10 years in projects that I have been involved with,
25 developing an approach to identifying and assessing

1 heritage resources, potential for heritage
2 resources, and protocols. We have procedures in place,
3 and I do believe we are now trying to move towards an
4 official protocol and how we will deal with treaty and
5 heritage resources in our planning and construction and
6 project management.

7 Q. I assume you will agree that such a
8 protocol is actually a good thing for the future?

9 A. Yes, I believe it is. From
10 transmission point of view we have had, in essence, a
11 protocol that we have been following. But yes, I think
12 it is a good thing. It puts the expectations of both
13 parties and the requirements clearly there in paper for
14 everybody to understand.

15 Q. When it comes to agricultural land,
16 isn't it true that we don't have a protocol like that
17 at this point?

18 A. Again, I have worked with the
19 Ministry of Agriculture and Food since the early 70s on
20 this whole matter. We have done a great deal of work
21 with them in terms of how they would like to see
22 agricultural resources considered in our studies. They
23 have been major intervenors at hearings. We have gone
24 through things like data requirements, the type of
25 information they would like us to have available. In

1 southwestern Ontario we spent \$300,000 upgrading the
2 provincial soil survey so we had a consistent data base
3 on which to assess all our transmission alternatives.

4 They have reviewed our construction
5 practices and policies, we have discussed those, we
6 have made those more explicit and clear and in response
7 to requests from the Ministry.

8 In my dealings with him, I never heard
9 them say we need a protocol. They have the Foodland
10 Guidelines which is the provincial policy statement - I
11 don't know if it's a policy statement now or not, or if
12 it's on the verge - Foodland Guidelines which set out
13 clearly the provincial policies with respect to
14 preservation of foodlands, and we certainly deal with
15 that and take those things into account.

16 But as far as the need for a natural
17 protocol, I have never had that suggested to me.

18 Q. Do you think that would be a useful
19 think to have?

20 A. I think it would be useful to put in
21 place, perhaps some practices we have already being
22 doing, but again to formalize things to let everybody
23 be aware of what's expected and what needs to be
24 carried out.

25 Q. I want to ask you some questions

1 about the Niagara Escarpment. I take it that you would
2 agree that this area has a special status in Ontario?

3 A. Yes, it does. It has its own Act to
4 protect it and to deal with its planning.

5 Q. Are you aware that the escarpment has
6 been designated by UNESCO as a biosphere reserve?

7 A. No, I wasn't aware of that.

8 Q. Originally there was --

9 THE CHAIRMAN: Isn't this a bit
10 site-specific, Mr. Moran?

11 MR. MORAN: I don't intend to get into
12 any site-specific issues, Mr. Chairman, beyond the
13 extent to which planning consideration is given to the
14 Niagara Escarpment if a transmission line would be
15 planned in that area generally, in general terms.

16 THE CHAIRMAN: But if a transmission line
17 is planned for that area, then it will be subject to
18 the site-specific project, won't it?

19 MR. MORAN: That's right. My questions
20 are just aimed at what kind of consideration from a
21 system planning point of view are given to special
22 areas such as the Niagara Escarpment Plan area which
23 really is an example of a special area more than
24 anything else.

25 [10:13 a.m.]

1 THE CHAIRMAN: Well, I suppose you are
2 ready to ask the questions, but please just keep them
3 very brief, if you will. I don't want to get into too
4 much of this.

5 MR. MORAN: I will be finished in about
6 five minutes, Mr. Chairman.

7 THE CHAIRMAN: All right.

8 MR. MORAN: Q. I will cut to the chase
9 on this question and basically ask you this: Given
10 that there is a special status granted to this area or
11 the fact that it is controlled by the Niagara
12 Escarpment Plan, an official plan of the province, how
13 does that factor into any planning process that relates
14 to transmission planning in that area?

15 MR. BANCROFT-WILSON: A. Well, as we
16 have done in the past and will continue to do, we
17 recognize there is a planning area there, but the fact
18 that there is a planning area identified doesn't mean
19 to say that we are going to ignore it.

20 Our facilities are permitted in the plan
21 into certain parts of the plan, so again, you have to
22 look at the site-specific aspects of the plan, the
23 areas you are dealing with. In some areas of the plan,
24 our facilities are not permitted and those would be
25 identified through the studies under sensitivity and in

1 other areas, our facilities are permitted.

2 Q. In the past you have had transmission
3 routes turned down for approval that cut across the
4 escarpment area.

5 How does that become factored into your
6 current planning process?

7 MRS. FORMUSA: I am not sure how the
8 witness can respond to that. That was another board's
9 decision taken in the circumstances and the evidence
10 before. I am not sure how that has any bearing on our
11 plans. I think we really are getting site-specific
12 here.

13 MR. MORAN: Well, Mr. Chairman, the
14 question is really just aimed at addressing perhaps a
15 potential area of uncertainty if there is transmission
16 planning anticipated for this area.

17 THE CHAIRMAN: Hasn't he answered the
18 question that you asked? Where they are not allowed,
19 they don't go. Where they may be allowed to go, they
20 study the sensitivities.

21 MR. MORAN: Then perhaps we will just
22 leave it at that then, Mr. Chairman.

23 Thank you very much. Those are my
24 questions, panel.

25 THE CHAIRMAN: Mr. Watson?

1 MR. WATSON: Yes, Mr. Chairman.

2 Mr. Chairman, I am indebted to the
3 counsel who have preceded me and I will be brief.

4 I have one interrogatory that I will
5 refer to. That is 7.9.23. And that has already been
6 given No. 434.23.

7 CROSS-EXAMINATION BY MR. WATSON:

8 Q. Dr. Macedo, I believe all of my
9 questions will be directed to you; however, feel free
10 to consult with your colleagues.

11 First of all I would like to deal with
12 the transmission planning period. I understand that
13 the lead time for planning and construction of
14 transmission facilities required for the Manitoba
15 Purchase is eight years; is that correct?

16 MR. BANCROFT-WILSON: A. Sorry, Mr.
17 Watson, I wasn't paying close enough attention since
18 you were talking to Dr. Macedo.

19 Q. I understand the lead time for
20 planning and construction of the transmission
21 facilities for the Manitoba Purchase is eight years; is
22 that fair?

23 A. It is in that order.

24 THE CHAIRMAN: Eight years from when, Mr.
25 Watson?

1 MR. WATSON: Q. Well, perhaps you could
2 help us with that, Mr. Bancroft-Wilson. My
3 understanding is that is the whole period through
4 definition and acquisition phase; is that correct?

5 MR. BANCROFT-WILSON: A. Our initial
6 schedule was -- the planning was started in the later
7 part of 1990 and we propose to have it in-service by
8 December '89 -- sorry, '99, December '99, so that is
9 about nine years.

10 The actual construction we anticipate to
11 take four to five years; and the planning approvals,
12 again, that is more uncertain, but roughly three to
13 four years.

14 Q. So the total process is about nine
15 years, is your estimate?

16 A. Eight to nine years, yes.

17 Q. Okay. Now, either Mr.
18 Bancroft-Wilson or Dr. Macedo. I would like to explore
19 the transmission that was associated with the Bruce
20 Complex to try and put this in some perspective.

21 The original recommendation for
22 transmission from Bruce was made by the Solandt
23 Commission; is that correct?

24 A. You mean for the first line out of
25 Bruce?

1 Q. Yes.

2 A. Because there were different lines
3 out of Bruce. The matters relating to the planning of
4 the first line were ultimately dealt with, in part, by
5 the Solandt Commission, yes, the southern part of the
6 line.

7 Q. And the Solandt Commission finalized
8 their report in 1970?

9 A. The Solandt Commission had numerous
10 reports. I am not sure the date of that particular
11 one.

12 Q. Is it fair to say it was in the early
13 70s? I don't want to pin you to it exactly.

14 A. Roughly in that period of time, yes.

15 Q. And one of the lines that was
16 recommended was a 500 kV line from Bruce to Longwood?

17 A. That was for the second line out of
18 Bruce and that was recommended in the early 80s or a
19 plan, the concept at the plan stage took place in the
20 early 80s.

21 Q. There are other lines that were
22 recommended by the Solandt Commission much earlier than
23 that, were there not, as you indicated the first line?

24 A. My knowledge is somewhat limited.
25 Their line from Bradley to Georgetown, as it was called

1 then, the first line out of the Bruce Generating
2 Station was dealt with in part by the Solandt
3 Commission and there were some environmental hearings
4 on that in the early 70s as well. I am not familiar
5 with anything else that they recommended.

6 Q. Is it fair to say that all of the
7 transmission recommended by the Solandt Commission was
8 not constructed?

9 A. To go back to my previous answer, I
10 really can't answer that with any degree of accuracy.

11 Q. Okay. Dr. Macedo, it is my
12 understanding that the Bruce Complex suffers from a
13 lack of transmission capability when all of the units
14 are in operation; is that fair?

15 DR. MACEDO: A. The plan to incorporate
16 Bruce has been completed now. We have the line from
17 Bruce to Longwood and the line from Longwood to
18 Nanticoke. Both are in service. And with all
19 facilities in service, all units at Bruce can be
20 incorporated.

21 THE CHAIRMAN: I am sorry. Just to make
22 sure I understand: They mean all units, all planned
23 units in service if, as and when they are put into
24 service; is that what you mean?

25 DR. MACEDO: I mean with all eight units

1 at Bruce, we need to arm generation rejection with all
2 facilities in service, but there is no locked-in
3 energy.

4 MR. WATSON: Q. I was going to get to
5 that point about generation rejection. Without
6 generation rejection, which we have heard some evidence
7 about in earlier panels, there is a lack of
8 transmission capability with respect to all of the
9 units at Bruce when they are in operation?

10 DR. MACEDO: A. Yes, we have a plan
11 though to put in run-back on the Bruce units. This
12 allows effectively the units to remain synchronized to
13 the system and continue to provide voltage support to
14 the system. And with that, the use of generation
15 rejection is not required.

16 Q. Well, in effect, Dr. Macedo or Mr.
17 Bancroft-Wilson, don't we have a situation where the
18 transmission associated with the Bruce Complex took
19 considerably more than the time that was expected and
20 resulted in an underbuilding of transmission?

21 A. It certainly took more time than was
22 required and -- I am sorry.

23 Q. Than expected?

24 A. Than expected. And the facilities
25 that were built were adequate, but just adequate.

1 Q. And when you say "adequate", that is
2 when you take into account the other schemes that you
3 have mentioned, such as generation rejection?

4 A. No, I did not mean that. I meant
5 there were several schemes proposed and the scheme that
6 was finally selected was just adequate, marginally
7 adequate.

8 [10:25 a.m.]

9 In other words, it left very little room,
10 for instance, for the supply in that area, for large
11 imports from Michigan and the like. So I am saying
12 there were other plans that would have permitted more
13 flexibility.

14 Q. Given the Bruce experience, Dr.
15 Macedo, is eight to nine years adequate for the
16 Manitoba Purchase transmission?

17 A. I believe it is. There were a lot of
18 reasons why the Bruce lines took longer to get approved
19 and brought into service, and we hope that won't be
20 repeated here.

21 MR. BANCROFT-WILSON: A. I think it is
22 fair to say that when the initial studies were
23 conducted, and you referred to the Solandt Commission,
24 that was all pre-Environmental Assessment Act, so a lot
25 of that process was started. So there was no formal

1 approval process. Those were the types of things that
2 helped give rise to the need for the Environmental
3 Assessment Act. I think since then the process has
4 become clear and more defined.

5 There are uncertainties in it, obviously,
6 and things that are beyond the control of the proponent
7 in that.

8 We have got over 130, 150 approvals under
9 the Environmental Assessment Act since 1975. Once we
10 started dealing with the second line through the EA
11 process, that took a period of about eight to nine
12 years from when we started real planning for the second
13 line, and in there was a setback -- the whole result of
14 one environmental assessment hearing was thrown out and
15 we had to repeat it. So, hopefully by avoiding those
16 types of things, a period of eight to nine years is a
17 reasonable period to project and plan on.

18 Q. Dr. Macedo, I would like to change
19 subjects to transmission with respect to non-utility
20 generation.

21 In your direct evidence you discussed the
22 five interfaces that we have spent some time talking
23 about so far. You also talked about the remaining
24 capacity for new supply in the planned upgrades. I
25 don't propose to go through those again. However, I am

1 curious as to whether you have any document that lays
2 out these upgrades that you discussed and provides the
3 capacity and cost of these upgrades, or is all of that
4 information going to be included in the undertaking
5 that you have gave to Dr. Connell?

6 DR. MACEDO: A. I wasn't going to
7 include costs of the upgrades. Some of the costs are
8 very course, especially the ones in the later period,
9 but if that is what you would like, we could add that
10 to the list.

11 Q. I would be interested in that, Dr.
12 Macedo. As I indicated, not just the information but
13 the documents, if there are any documents behind this.
14 You spent some time telling us about the interfaces,
15 the troubles with the interfaces, is there any one
16 document or set of documents which describes all this?

17 A. No, there isn't.

18 Q. Where did this information come from?

19 A. You mean the basis for those numbers?

20 Q. Yes.

21 A. They are based on a lot work that has
22 been done across the department by a lot of different
23 people, and it's a compilation of that information.

24 We may, in the next several months, put
25 some document together, but at this stage there is no

1 document.

2 Q. And your answer indicates how you
3 calculate the figures on page 8 of Exhibit 433. There
4 is no documentation behind this. This is, as you say,
5 a compilation of information in your department?

6 A. That's correct.

7 MR. WATSON: Mr. Chairman, my client
8 would be very interested in this type of documentation
9 that Dr. Macedo was referring to just now in his
10 answer. If, in fact, Hydro is going to put something
11 together, my client would certainly like to see a copy
12 of it.

13 As a matter of fact, to put it more
14 strongly I would like Dr. Macedo to undertake to put
15 that documentation together.

16 THE CHAIRMAN: The best we can do, if he
17 does put it together, he will make it available.

18 MR. WATSON: Perhaps I could register my
19 earnest request that Dr. Macedo do that.

20 THE CHAIRMAN: Would it be appropriate to
21 include this under the umbrella of the Dr. Connell
22 undertaking?

23 MR. WATSON: I certainly think so, Mr.
24 Chairman.

25 DR. MACEDO: Mr. Chairman, the

1 undertaking that we were going to provide for Dr.
2 Connell was one page that explained the transmission
3 reinforcements that are required to get to those
4 different levels, and we will add some cost figures to
5 those transmission reinforcements, and that is all I
6 was planning to do. I hope that's what Dr. Connell
7 expected me to do.

8 DR. CONNELL: Yes, I expect it will be
9 quite a big page. [Laughter]

10 DR. MACEDO: That was figuratively
11 speaking. It might be two or three pages, but it
12 wasn't meant to be a comprehensive report, similar to
13 the one that Mr. Watson expects of us.

14 I think what you are after, Mr. Watson,
15 are the study results that support those numbers.

16 MR. WATSON: Q. Exactly, the analysis
17 for those numbers.

18 DR. MACEDO: A. And that's certainly
19 more than two or three pages. That's quite a big
20 document, because there are five interfaces there and
21 each interface, to provide all the data to support
22 those numbers across the three different time periods
23 is a lot of work, and we are probably talking about
24 five reports really, and each report is quite an
25 extensive piece of work, several months it. It can be

1 done concurrently, but it's not something that we had
2 contemplated doing.

3 THE CHAIRMAN: I guess my question
4 perhaps to that would be: How do you know that there
5 is any validity to the figures that appear at the end
6 if you don't have some back-up for it?

7 DR. MACEDO: We have some back-up. Yes,
8 the back are --

9 MR. WATSON: I would like to see the
10 backup, then, Mr. Chairman.

11 DR. MACEDO: Well, the back-up, lots of
12 data, but unless you have an explanation as to what
13 that data means, like for example --

14 THE CHAIRMAN: Let me interject. Someone
15 sat down and did that -- what is the number of the
16 page?

17 MR. WATSON: Page 8 of 433.

18 THE CHAIRMAN: Someone sat down and
19 created page 8 and they didn't do did off the top of
20 their heads. They must have had something that they
21 were working on when they did that. I guess that's
22 what Mr. Watson is asking for.

23 MR. WATSON: That's it, Mr. Chairman. I
24 guess I am interested in a little bit more than Dr.
25 Connell asked for. He wants one large page, I am

1 interested in maybe one large report.

2 THE CHAIRMAN: Perhaps it's something
3 that could be informally discussed, but we can reserve
4 it with a number so that we don't lose track of it.

5 MR. WATSON: That is fine, Mr. Chairman.
6 I will discuss this with Mrs. Formusa at a break in the
7 hearing.

8 THE CHAIRMAN: Could we have the next 442
9 number?

10 THE REGISTRAR: .15.

11 ---UNDERTAKING NO. 442.15: Ontario Hydro undertakes to
12 provide background documents behind
13 Exhibit 433, page 8.

13 MR. WATSON: Q. Dr. Macedo, I have
14 provided your counsel with an Interrogatory 7.9.23 -
15 434.23, and that's an interrogatory from the MEA
16 inquiring about the expenditures for transmission and
17 distribution over the next five years for each region
18 within the system. You answered that question
19 providing gross figures for transmission and
20 distribution, however, you did not break them down by
21 region. You indicated that the breakdown was not
22 available.

23 Can you help me with why that breakdown
24 is not available and whether in fact you could provide
25 us with that breakdown?

1 DR. MACEDO: A. Let me answer the first
2 question.

3 We don't have that information by region
4 because we don't separate plans out by region. We have
5 plans for the system.

6 Now one could go through all the plans
7 and say, now, which region does this plan fall in and
8 try and separate it out like that. In many cases the
9 plans cover several regions. If we just go back to the
10 north/south transmission plan, it covers the
11 northeastern region and central region because it's an
12 inter-area transmission line. And so you get into
13 problems of delineating things, and so I am not sure
14 how useful it would be.

15 There are certainly plans obviously that
16 fall within a particular region and they are
17 straightforward. The inter-area plans are clearly
18 across regions. We don't keep a record of those
19 things.

20 Sorry, I missed the second part of your
21 question.

22 Q. One minute, Dr. Macedo.

23 The question had two parts. The first
24 was: Are the figures still not available, and the
25 second part was, if they are available, can you provide

1 them?

2 THE CHAIRMAN: I think the answer was
3 they are not available.

4 MR. WATSON: Exactly.

5 Q. Dr. Macedo, looking at page 8 of
6 Exhibit 433, it provides the capability to incorporate
7 new supply. As I understand this graph, in each case
8 the full amount listed is available for NUG
9 development; is that correct? That doesn't
10 necessarily mean there has to be NUG development there
11 but the full amount is available for NUG development.

12 DR. MACEDO: A. In each column I have
13 indicated a megawatt number and hydraulic development,
14 or Manitoba Purchase as the case might be. So you
15 could either treat -- and in the bottom, in the legend
16 I have given you the size of those developments. And
17 yesterday I cautioned Mr. Shepherd that he should not
18 replace the hydraulic development with an equivalent
19 NUG development because some of those are peaking
20 projects and NUGs are base-loaded. So, it's not a
21 one-for-one swap in some cases. So, if you accept
22 those, then the numbers, the megawatt numbers
23 themselves are available for new supply and it could be
24 NUGs, it could be anything else.

25 Q. Just so I understand, as an example

1 in the top left-hand corner, the 250 megawatts in the
2 west system by 1996, that could be all NUGs?

3 A. That could be all NUGs.

4 Q. Doctor, do you have any documentation
5 that examines how the transmission constraints that we
6 have been talking about, the five interfaces, affect
7 the 3,100 megawatt NUG forecast?

8 A. The 3,100 megawatt forecast can be
9 broken down in a number of ways according to the
10 different parts of the province. We have indicated in
11 page 8 the capacity across the different parts of the
12 province. If you add those numbers up, say, in the
13 first column, up to '96, I believe you get pretty close
14 to 3,100 megawatts. I don't know what the number is.
15 2,960.

16 [10:38 a.m.]

17 In fact, you don't add the first column;
18 you just add row 3, 4 and 5 because rows 1 and 2 will
19 captured in row 3; row 3 representing the whole of
20 Northern Ontario. So if you add rows 3, 4 and 5 in
21 this the first column, you should come to the 2,960.

22 Q. It does.

23 A. So that is pretty close to 3,100.
24 Now, we haven't included in there the area between the
25 two interfaces, FIGTA and CCR interfaces, which is

1 essentially in the Greater Toronto area and there is
2 plenty of room there to add NUGs. So there is room
3 across the province to add 3,100 megawatts.

4 Q. Doctor, it seems as though the answer
5 to that question takes me back to the first question I
6 asked, about the documentation for the interfaces; is
7 that fair?

8 If I get that documentation, that is
9 going to help me out with the question I asked about
10 the 3,100 megawatt NUG forecast?

11 A. No, I don't think it would.

12 Q. Well, okay. Then my question is: Is
13 there any other documentation that is going to help me
14 out with understanding the transmission constraints
15 with respect to the 3,100 megawatts in the NUG
16 forecast?

17 A. Well, in order to bridge the gap
18 between page 8 and the 3,100 megawatt NUG forecast, you
19 have to know where the 3,100 megawatts is likely to be
20 located across the province: How much of the 3,100
21 megawatts is in the northeast, how much of it is in the
22 west system, how much of it is in the southwest; how
23 much of it is in eastern Ontario and central Ontario?

24 And I am not sure if this was discussed
25 in Panel 5 or not, if they did give a breakdown by the

1 different regions. If they did, then you have that
2 information and you have information on page 8 and you
3 can put the two together and you have got your answer.

4 Q. Doctor, is your answer the same if I
5 ask you the question, are any of the forecast NUGs
6 going to be delayed or rejected due to transmission
7 constraints?

8 A. I don't know. It depends where they
9 are located. If there are certain NUGs that want to be
10 located in eastern Ontario and they exceed the limits
11 that I have given in that page --

12 Q. When you say "the limits you give",
13 and that is on page 8 of Exhibit 433?

14 A. Yes, page 8. For instance, if 1,000
15 megawatts of NUGs want to be located in the Oshawa area
16 for the sake of argument, we could not incorporate
17 those into the system before '96.

18 Q. Dr. Macedo, looking at page 8 of
19 Exhibit 433, you show a 250 megawatt capacity in the
20 west system to incorporate new supply by 1996.

21 Now, based on my understanding of the
22 current policy for integrating NUGs into the
23 transmission system, you would reject any NUGs beyond
24 the 250 megawatt constraint unless they paid for
25 transmission upgrades or advancement in the timing of

1 the upgrades; is that fair?

2 A. Yes, that is fair. The only
3 advancement of facilities that we could do would be the
4 series capacitors.

5 Q. Yes. Now, after the year 2000, you
6 show a 350 megawatt capability for the new supply in
7 the west region. This means that an additional 100
8 megawatts of NUGs could be built after the year 2000.

9 Now, as I understand it, those NUGs would
10 not pay for any portion of the transmission upgrade; is
11 that correct?

12 A. No, I don't think that is correct.
13 We are looking at different mechanisms for allocating
14 costs to the programs that cause transmission upgrades.
15 So, if you have the Manitoba Purchase, non-utility
16 generation and any hydraulic developments that require
17 transmission upgrades, we are looking at how best to
18 share the cost of those upgrades among those programs.
19 We haven't determined that yet.

20 Q. But just so that there is no
21 misunderstanding, my question was that after the year
22 2000, you would be in a position where you could build
23 100 megawatts of NUGs; is that fair?

24 A. The 100 megawatts is after the
25 Ontario/Manitoba interconnection is in place.

1 Q. That is correct.

2 A. Yes. It gives us room to add another
3 100 megawatts of NUGs.

4 Q. So at some time after the fact, after
5 the purchase interconnection has been completed, you
6 would then be in a position to add 100 megawatts of
7 NUGs?.

8 A. That's correct.

9 Q. All right. And are you telling me
10 that those NUGs would pay for some portion of the
11 transmission upgrade that had gone before it?

12 A. I don't see why not if that is the
13 policy we come up with, yes.

14 Q. Okay. Well, the current policy is
15 that they would not, is that fair, because they are
16 coming after the fact? The transmission is there.
17 There is room for them, so they would not pay for the
18 transmission. That is the current policy.

19 A. I am not sure that that is the
20 current policy. The current policy is that all NUGs
21 get credit for deferring transmission. And then if
22 they cause any particular upgrades, they are charged
23 their share of that upgrade.

24 Now, it gets very complicated when you
25 have a number of programs causing that upgrade. Some

1 of that upgrade is required for load supply, for
2 instance. And so how do you apportion the cost of
3 these is something that we are looking at.

4 But I don't see any reason why we can't
5 say today that the capability is 'X' after we upgrade;
6 the capability is 'Y'; the cost of going from 'X' to
7 'Y' is so-and-so and we will then determine the dollars
8 per kilowatt cost for all developments that use up that
9 capacity, whether they develop before -- of course,
10 they can't develop before -- but let's say even before,
11 if they develop before and after.

12 Let me give an example of this. A good
13 example is the north/south in fact, the north/south
14 transmission. The capability of the existing
15 north/south transmission is 1,600 megawatts for flow
16 south. We are proposing to upgrade that capability by
17 upgrading the thermal capability of the lines and
18 adding series capacitors to those lines. That takes is
19 up to 2,700 megawatts. And then we build a third line
20 and that goes to 4,400 megawatts. So there is an
21 increase of 2,800 megawatts in that range.

22 We know the cost of doing those upgrades
23 so we can get dollars per kilowatt cost for new
24 capacity. The first kilowatt that is used, that uses
25 up their capacity could be charged that dollar, so many

1 dollars and that could be --

2 When we build the capacity, the ones that
3 use some of it - that come on now for instance - can
4 use some of the capacity. When we build the facility,
5 we have more capacity and the ones that come on after
6 are still charged the same amount as the ones that come
7 on before increasing the capacity.

8 Q. I understand that, Dr. Macedo, and
9 that is one of my points; the timing shouldn't make a
10 difference. My understanding is that in the past, the
11 timing has made a difference.

12 Are you telling me now Hydro's position
13 is that the timing of NUGs will not make a difference
14 because my client would like that assurance?

15 A. I am just trying to think back. When
16 you say "in the past", we haven't really been
17 allocating costs to NUGs for inter-area transmission.

18 Q. Exactly. And if you haven't been
19 doing that, then you couldn't allocate a dollar per
20 megawatt charge and then charge it to the NUGs.

21 What you have been doing in the past is
22 if there is transmission room, a NUG can get permission
23 to build in a certain area and there is sufficient
24 transmission capacity.

25 The alternative is if there is no

1 transmission capacity, a NUG either has to pay for the
2 upgrade or it doesn't get on. So the timing has made a
3 difference in the past.

4 What you are telling me now is that
5 timing is not going to make a difference in the future
6 and my client would like that assurance if you can give
7 it.

8 A. I am telling you that we are giving
9 that consideration. It is something we are working on.
10 We haven't arrived at a firm policy on this, but we are
11 moving in that direction.

12 Q. When you say you are giving a
13 consideration, is it fair to say that you recognize
14 that there is a difficulty with what has occurred in
15 the past and you are attempting to address that
16 difficulty and proceed in the direction where timing
17 shouldn't be significant?

18 A. We recognize that when you use up
19 spare capacity on the system, you are effectively
20 advancing the need for reinforcements and, therefore,
21 anyone who uses the spare capacity should be charged
22 the cost of facilities that you are going to advance.
23 And as I said, we are giving this serious
24 consideration.

25 Q. Can you give me any indication as to

1 when a decision would be made with respect to this?

2 A. No, I can't do that.

3 THE CHAIRMAN: There seems to be two
4 things here: One is, let's say, the Manitoba
5 transmission is in place and there is room for a new
6 NUG; whether the new NUG should have to contribute to
7 the cost of the putting in of the Manitoba transmission
8 or whether the NUG should contribute to the anticipated
9 cost of advancing the need for future reinforcement in
10 the future.

11 Those are two different concepts, are
12 they not?

13 DR. MACEDO: Yes, Mr. Chairman.

14 THE CHAIRMAN: Am I right that in the
15 past NUGs have not had to pay for either of those
16 things? They have only had to pay for the additional
17 cost that is incurred by putting that particular
18 facility, the NUG facility, in place?

19 DR. MACEDO: That is correct. The reason
20 why I moved from the west system to the north/south
21 because it is much clearer there, but you are right.

22 MR. WATSON: Q. The Chairman has my
23 point exactly and just to follow up on it: In
24 particular with respect to the Manitoba Purchase, it is
25 going to give you an extra 100 megawatts of capacity to

1 add, for instance, NUGs.

2 If, in fact, the interconnection was made
3 100 megawatts smaller, there would be a certain
4 reduction in the cost of the interconnection and you
5 could calculate what that cost would be and charge it
6 appropriately. Just one example, as you indicated
7 earlier, the series capacitors.

8 DR. MACEDO: A. Yes, you could do that,
9 but we design the system for 1,500 megawatts because we
10 want to use the extra capacity to import surplus energy
11 from Manitoba.

12 Now, if you add the 100 megawatts of
13 NUGs, let's say, in the west system, that impacts not
14 just the west system; it impacts the north/south as
15 well.

16 So I am suggesting to you that it is
17 using up spare capacity on the north/south, and so you
18 could argue that the NUGs in the west system should
19 bear proportionately the upgrading cost of the
20 north/south, and these are the sorts of things we are
21 looking at.

22 [10:55 a.m.]

23 Q. Dr. Macedo, my client, as I
24 indicated, is very interested in what the Chairman
25 summarized to you very succinctly, and what you have

1 advised me is currently under consideration. I assume
2 that this goes back to one of the earlier
3 cross-examinations talking about transmission and
4 generation being planned together.

5 Is it fair to say that when you plan for
6 transmission you generally consider NUG development in
7 the decision to upgrade, or are you going to in the
8 future?

9 A. I would say that we build into our
10 plans a lot of flexibility and one way we use that
11 flexibility is to incorporate NUGs. So, in other
12 words -- maybe that is a convoluted way of saying we
13 are going to fix up the transmission system.

14 We are going to increase the FIGTA
15 interface to 6,000 megawatts from 4,500 megawatts, and
16 that will provide more room for new supply and to use
17 our interconnections. We are going to fix up the CCR
18 interface by providing switching at Claireville and
19 Cherrywood and upgrading the 230 kV lines out of
20 Cherrywood. We are going to proceed with upgrading the
21 north/south interface, as I have indicated. So we are
22 doing all those things, and having done all those there
23 is opportunity then to incorporate NUGs.

24 The main point I want to leave with you
25 here is that we need this flexibility to cope with an

1 uncertain future. Should demand management not pan out
2 the way we expect it to, should the load growth be
3 higher than we expect it to, we need to have the
4 flexibility of short lead time options that we have on
5 plan to put in place to meet that load growth, and
6 without transmission capacity those short lead time
7 supply options are not feasible.

8 Q. I appreciate that flexibility point,
9 Doctor. My client's concern is that this flexibility
10 is appropriately costed. As you indicated earlier, you
11 are looking at costing this with respect to a dollar
12 per kilowatt charge which could be charged to NUGs
13 regardless of the timing.

14 I was into a more general area, whether
15 in fact this was being dealt with on a more broad basis
16 in considering NUGs in the decision to upgrade.

17 A. Sorry, I don't understand your
18 question.

19 Q. If, in fact, you have got a situation
20 where you are going to a policy where you are going to
21 value, shall we say, the capacity on the transmission
22 line, it would seem to me that if part of your
23 rationale for increasing transmission lines is
24 flexibility in incorporating NUGs, then the appropriate
25 costing philosophy should be applied to the NUGs in

1 that situation; is that fair?

2 A. That's the direction we are moving
3 into, that's right. As I said, the difficulty is
4 that -- we are going to reinforce the system for a
5 number of reasons, and the difficulty is determining
6 how much of that you allocate to NUGs, how much of that
7 you say is due to load growth and therefore is part of
8 normal system explanation, and so on, and this is why
9 it's not something that we can do overnight and we are
10 giving it serious consideration.

11 Q. True. I will move on right after
12 this, Doctor, but you are going to know the cost of the
13 updates, you are going to know when a NUG comes along
14 that it is going to require 100 megawatts, you can
15 simply take the cost, apply it proportionately to that
16 NUG and charge it appropriately. It sounds pretty
17 simple.

18 You don't need to know now. When it
19 comes along you know the cost, you apply the cost to
20 the supply and away you go.

21 A. That's one approach. There are
22 others, and we need to give this consideration and we
23 are doing that.

24 Q. Doctor, you indicated in your earlier
25 cross-examination that the addition of NUGs to the west

1 system will only defer the need for transmission up to
2 a point. I don't think you need to go to the exact
3 page, I don't think there is any dispute about that. I
4 have it if you need it.

5 You also stated that any change in the
6 load in generation balance in the west system would
7 result in increased costs or lower reliability.

8 Now, would you then agree that NUGs, at
9 least in the case of the east/west integration, will
10 contribute to the need for transmission rather than
11 reducing the need for transmission?

12 A. It depends how they phased the load
13 growth. The load growth in the west system is about 30
14 megawatts a year. If you add NUGs at 30 megawatts a
15 year, the situation would be no different to what we
16 have today.

17 Now, if the load drops in the west
18 system, because we discussed the volatility of loads in
19 the west system, if the load drops in the west system,
20 then some of that generation will be bottled in the
21 west system, so there is a cost to that. And then you
22 have to weigh up the cost of that bottled capacity
23 against the cost of reinforcing that east/west
24 interface and make appropriate decisions.

25 Q. So what you are saying, the NUGs in

1 the west system may contribute to the need for
2 transmission or they may not, depending on the factors
3 that you indicate?

4 A. That's right.

5 Q. Well, as I understand it, Hydro's
6 policy is that for NUGs in the west region, for NUGs
7 everywhere, you include a 4 per cent transmission adder
8 in the avoided cost paid, yet certainly we know in the
9 west system some of these NUGs are contributing to the
10 requirement for transmission; isn't that fair?

11 A. The 4 per cent I think is losses you
12 are talking about. But yes, we apply these numbers
13 uniformly across the system. We don't treat the west
14 system any differently to the northeast or the south.
15 And the reason we do that, or we have been doing that,
16 is because NUGs were small in size, they were uniformly
17 disbursed across the province and they weren't a large
18 part of the system, and so it was appropriate to use
19 average figures across the system.

20 Now, with NUGs being large in size, being
21 concentrated in certain areas of the system and
22 becoming a large part of those areas, we are again, as
23 part of the earlier exercise, examining mechanisms to
24 reflect the regional nature of the cost and benefits of
25 NUGs.

1 Q. So what you are saying, Doctor, is
2 that the transmission adder now is a levelized, or as
3 you said, an average addition to the avoided cost of.

4 What you are saying is that you are now
5 going to consider departing from that levelized or
6 averaged across the board addition to avoided cost and
7 consider the transmission requirements for each
8 individual NUG and determine whether they should get
9 net or whether they should be contributing to the cost
10 of transmission; is that fair?

11 A. I am not sure it would be for each
12 individual NUG. It probably would be for each part of
13 the system. And this is something that we are
14 considering. We don't know how we are going to do it,
15 but we hope to arrive at some method of doing that
16 fairly soon.

17 Q. Doctor, my understanding is that
18 while NUGs have paid for transmission facilities with
19 respect to radial transmission, there are no instances
20 of NUGs that have paid for inter-area transmission; is
21 that correct?

22 A. That's correct.

23 Q. I also understand that NUGs, which
24 use Hydro's transmission do not contribute toward the
25 OM&A of transmission lines?

1 A. Is your question that they are not
2 charged for OM&A?

3 Q. Yes.

4 A. I'm not sure about that. It's really
5 a NUG matter which I can't comment on really.

6 Q. Well, I assume there is no doubt in
7 your mind that major supply options contribute to OM&A
8 of transmission?

9 A. Yes, they do.

10 Q. And you are not sure about NUGs?

11 A. The way the avoided cost for NUGs are
12 calculated and contracts are prepared and so on is
13 something that I don't get involved with; in fact,
14 transmission system planning doesn't get involved with.
15 That's really something that the NUG division prepare.

16 We provide them with the transmission
17 cost information. Essentially, we only provide them
18 with the capital cost, transmission cost information
19 and losses, and then they work that into the avoided
20 costs and contracts for NUGs.

21 Q. So you do not provide the NUG
22 division with transmission OM&A numbers?

23 A. We don't but they may get it from
24 other parts of the corporation.

25 THE CHAIRMAN: Have you checked, has this

1 come up in Panel 5, do you know?

2 MR. WATSON: I don't believe so, Mr.
3 Chairman.

4 THE CHAIRMAN: I don't remember, offhand.
5 But it seems to me it's a fairly basic question and
6 somebody should be able to answer it.

7 MR. WATSON: Perhaps I could pursue that
8 with Mrs. Formusa outside of the hearing room.

9 Q. Dr. Macedo, I think we can all agree
10 that while one NUG, one small NUG may not contribute
11 significantly to transmission OM&A or upgrades, can we
12 agree that one very large NUG or cumulative impacts of
13 many small NUGs certainly could have an effect?

14 DR. MACEDO: A. Yes, they could.

15 Q. Now, if a NUG is within the service
16 territory of a municipal utility, that NUG pays for a
17 wheeling or some other charge that makes a contribution
18 toward the transmission cost to help pay for the
19 transmission they use; is that fair?

20 A. I'm not familiar with that subject at
21 all.

22 Q. Let's just assume that NUGs do pay a
23 certain charge to municipal utilities for wheeling or a
24 similar type of situation, has Hydro considered a
25 policy where NUGs would pay a similar type of charge to

1 Hydro, either directly or through a discount in their
2 purchase price?

3 A. I think you are getting into a lot of
4 detail on NUGs that really I have no expertise on and
5 it is something that you should take up with the NUG
6 division, if you haven't done it in Panel 5.

7 MR. WATSON: Those are my questions, Mr.
8 Chairman - thank you - subject to pursuing things with
9 Mrs. Formusa as discussed, and if in fact that
10 undertaking requires further attention by the Board I
11 will return.

12 THE CHAIRMAN: Thank you, Mr. Watson.

13 Ms. Marlatt, you are next?

14 MS. MARLATT: Good morning, I would like
15 to start by introducing myself to the panel. My name
16 is Constance Marlatt, and I am here today representing
17 the North Shore Tribal Council, United Chiefs and
18 Councils of Manitoulin, and the Union of Ontario
19 Indians.

20 I would like to start by asking you if
21 everyone has a copy of the materials to be used in
22 cross-examination by the North Shore Tribal Council.

23 I would like to start by asking the Chair
24 if we can have those marked as an exhibit.

25 THE REGISTRAR: No. 461, Mr. Chairman.

1 ---EXHIBIT NO. 461: Materials to be used in
2 cross-examination of Panel 7 by NSTC,
3 UCCM and UOI.

4 CROSS-EXAMINATION BY MS. MARLATT:

5 Q. Now, my first area of
6 cross-examination will be some very general questions
7 on consultation, and I believe these questions should
8 be directed at Mr. Bancroft-Wilson.

9 I would like you to look at page 1 of
10 the materials I have provided to you, which is page
11 17018, Volume 96 of the transcript. Starting at line
12 20, you stated that:

13 "Public consultation also helps us in
14 our decision-making by providing us with
15 reasons and positions that people take on
16 certain aspects of the study. By fully
17 understanding those we are better able to
18 incorporate them or reflect them in our
19 decisions.

20 Finally, I think an open and
21 accessible planning process is very
22 important in helping build credibility of
23 the process itself and ultimately in the
24 acceptability of any decisions and
25 recommendations that come out of that
 process."

1 So, Mr. Bancroft-Wilson, in your opinion
2 public consultation then can help to create an open and
3 accessible planning process which will give credibility
4 to the process; is that correct?

5 MR. BANCROFT-WILSON: A. Yes, that's
6 correct.

7 Q. Thank you. Prior to the
8 environmental assessment for the DSP hearing being
9 finalized, there was no public consultation on the
10 question of who Ontario Hydro would purchase power
11 from; is that correct, Mr. Bancroft-Wilson?

12 A. You are talking about the purchase?

13 Q. Yes.

14 A. The purchase from Manitoba, I would
15 have to refer that either to Mr. Huggins or Dr.
16 Tennyson.

17 Q. Dr. Tennyson?

18 DR. TENNYSON: A. As I have indicated a
19 few times, there was consultation leading up to the
20 Demand/Supply Plan at various stages. It started
21 mid-80s and it did involve discussion of purchases.

22 Q. No, Dr. Tennyson, what I was asking
23 was whether or not there was discussion specifically on
24 the question of where the purchase would come from, not
25 the issue of their being a purchase of power, I

1 recognize that's your testimony. Was there any
2 discussion in those public consultation meetings about
3 buying power specifically from Manitoba?

4 A. I can refer this across perhaps. But
5 my understanding is when we discussed purchases there
6 were all types of purchases being discussed at that
7 time from various parts of the country. So yes, in
8 fact I would say that the suggestion that a purchase
9 might come from Manitoba was discussed.

10 Q. Did you receive public input on that
11 issue then, specifically of a purchase from Manitoba?

12 A. No. As I indicated, the input that
13 we received was on purchases generally.

14 Q. So you have no written documentation
15 on the public opinion about buying power from Manitoba;
16 is that correct?

17 A. My understanding is that when the
18 documentation was done and there are reports that were
19 done, it talked about specifically what came out of the
20 public consultation with respect to purchases, and so
21 therefore any of those issues that I have already
22 identified were the ones that came up.

23 Q. All right. So there is nothing in
24 the documentation then that you can provide us with
25 that specifically deals with the issue of whether or

1 not First Nations gave their opinion during the public
2 consultation phase about a purchase from Manitoba?

3 A. All I can say is that they were
4 provided the opportunity. Some representatives did
5 attend the various sessions.

6 If you are speaking specifically about
7 First Nations as opposed to all Aboriginal peoples,
8 then -- are you?

9 Q. Yes, I am.

10 A. Okay. I was going to suggest that
11 OMAA had presented a brief to the Select Committee.

12 Q. No, I am specifically asking, though,
13 about First Nations with regards to the Manitoba
14 Purchase. Do you have any written documentation about
15 their input on that issue? Yes or no? Just on the
16 issue of Manitoba.

17 A. Perhaps I am not understanding your
18 question.

19 Q. Dr. Tennyson, it's been your
20 evidence, as I have understood it, that you consider
21 there to have been a public consultation process even
22 with regards to the First Nations on the issue of
23 purchasing power.

24 My question is whether or not you have
25 any written documentation that you can provide us with

1 to tell us what the First Nations told you specifically
2 with regards to the Manitoba Purchase?

3 [11:13 a.m.]

4 A. I don't think they specifically
5 offered a statement on the Manitoba Purchase, no.

6 Q. Did you specifically ask them for a
7 statement?

8 A. I wasn't involved in those
9 consultations. I didn't even work at Ontario Hydro
10 then.

11 All I can assure you is that we have lead
12 in evidence, on this panel and the previous panel, that
13 there was consultation and that First Nations were
14 involved and that their concerns were identified.

15 THE CHAIRMAN: Are you suggesting that
16 there were some comments made on the Manitoba Purchase?

17 MS. MARLATT: Well, it is my
18 understanding from the evidence and from the
19 documentation that consultation was limited to the
20 question of --

21 THE CHAIRMAN: No, no, you are not
22 listening to my question either.

23 MS. MARLATT: No, no, I am not suggesting
24 that.

25 THE CHAIRMAN: Are you suggesting to this

1 witness that there were comments forthcoming on the
2 merits or demerits of the Manitoba Purchase?

3 MS. MARLATT: No. I am just asking
4 whether or not they had any comments. Since it seems
5 to be the evidence that they were asked about a
6 Manitoba Purchase, I would like to know whether or not
7 there is any written documentation on that.

8 THE CHAIRMAN: Well, I assume if they
9 said nothing, there wouldn't be any.

10 MS. MARLATT: Exactly. I assume also if
11 they weren't asked, there wouldn't be any.

12 DR. TENNYSON: I would assume that people
13 weren't asked. As I said, purchases were discussed.

14 MS. MARLATT: Well, I would like an
15 undertaking, if there is any information specifically
16 on --

17 THE CHAIRMAN: That must be in your own
18 client's knowledge, Ms. Marlatt. I think the question
19 has been answered.

20 MS. MARLATT: Thank you.

21 Q. Dr. Tennyson, I would like you to
22 look at page 3 of the materials I provided you with
23 and I would like to ask you just a couple of questions
24 on the co-planning issue.

25 And you refer at page 17081, Volume 97,

1 to a socio-economic impact assessment that you used to
2 study area. And at line 11, you state that:

3 "Moreover, Ontario Hydro recognizes
4 the distinct legal, historical and
5 cultural status of First Nations and that
6 First Nations are to be consulted as
7 governments."

8 On the next page, you will see an
9 Interrogatory No. 7.10.90.

10 THE REGISTRAR: That will be 434.114.

11 ---EXHIBIT NO. 434.114: Interrogatory No. 7.10.90.

12 MS. MARLATT: Where there seems to be a
13 description as a basis for developing a respectful and
14 cooperative working relationship with First Nations on
15 these studies, Ontario Hydro has developed the
16 following principles. One of those principles includes
17 consulting First Nations as governments.

18 Q. Dr. Tennyson, do you agree with the
19 answer to this interrogatory?

20 DR. TENNYSON: A. Yes, I do.

21 Q. Are you familiar with the term
22 co-planning as it was discussed here in Panel 6?

23 A. Yes, I am.

24 Q. Would it be possible that the
25 definition of co-planning from the transmission aspect

1 may be a respectful and cooperative working
2 relationship with First Nations on joint studies?
3 Would that be accurate, Dr. Tennyson?

4 A. That is the words that we have
5 identified. We are working on joint studies. That is
6 the basis for them on the Ontario/Manitoba
7 interconnection project.

8 Q. So would it be correct, Dr. Tennyson,
9 that in your mind co-planning does not include a veto
10 power by First Nations?

11 A. I have not defined co-planning. What
12 I am talking about are joint studies.

13 Q. All right. So you don't use the term
14 co-planning at all then in the transmission line study?

15 A. We hadn't. We started this before
16 those discussions.

17 Q. All right.

18 A. And I understand from the definition
19 discussed at Panel 6 that co-planning referred to joint
20 studies as well.

21 Q. All right. From this interrogatory,
22 Dr. Tennyson, you accept the concept of First Nations
23 as governments; correct?

24 A. It is consistent with the statement
25 of political relationship, yes.

1 Q. All right. How do you incorporate
2 that concept into your planning process?

3 A. What we stated right here is that we
4 will consult with them.

5 Q. All right. In the last sentence then
6 of that interrogatory from the answer, the answer
7 states:

8 Once these studies are completed, both
9 the First Nations and Ontario Hydro will
10 be able to determine a degree of
11 acceptability of the Manitoba Purchase
12 and its associated transmission line.

13 Dr. Tennyson, I am just curious about the
14 term "degree of acceptability". Does that imply some
15 aspect of decision-making on the part of the First
16 Nations?

17 A. When we went and started talking to
18 First Nations all across Northern Ontario, we talked
19 about what type of consultation might be appropriate,
20 what type of studies might be appropriate.

21 And in coming to developing these working
22 relationships with them, clearly, one of the, I think,
23 advantages to all parties is that with the information
24 that will be collected, then First Nations themselves
25 as well as Ontario Hydro would be able to understand

1 the various impacts and what the project would mean to
2 them. And it was stated at that time and continues to
3 be a principle that as a result of these studies, they
4 may or may not support the project.

5 Q. All right. So the question of
6 whether or not it is acceptable to the First Nations,
7 what is meant there is whether or not they want to
8 support Ontario Hydro in the project?

9 A. No. I think in the sense of what
10 anyone -- in terms of acceptability would mean, what
11 are the impacts? What do you understand about it?
12 What can be done? What are the impact management
13 measures. And ultimately, how appropriate is the
14 project in specific locations?

15 Q. All right. Thank you. Would your
16 answers also apply to the radial lines that would
17 result from supply options other than the lines from
18 the Manitoba Purchase?

19 A. What answer? I mean, which specific
20 one?

21 Q. Well, the radial lines from hydraulic
22 projects.

23 A. No, no, I didn't mean that. I
24 thought you said would your answer and I don't know
25 what --

1 Q. The answer that you just give me
2 about acceptability. I am particularly concerned about
3 the answer to this interrogatory and I just want to
4 know if this paragraph relates also to radial
5 transmission line construction in terms of, joint
6 studies is the term used.

7 A. I don't really know how to answer
8 that. I don't know why you would focus on the last
9 paragraph. I mean, if I am doing any project-specific
10 studies, the principles would apply in the sense of
11 wanting to consult, wanting to see what the data base
12 was like and then try to together understand once again
13 the impacts and, you know, anything else about the
14 project.

15 So, am I misunderstanding your question
16 again?

17 Q. Well, Dr. Tennyson, I was just
18 wondering if the planning process used, that you are
19 using right now in the Manitoba Purchase study, would
20 that be the same as the planning process you would use
21 in radial lines?

22 A. Okay. That is clearer for me. This
23 is not a monolithic approach in terms of -- obviously,
24 wherever a project would start up, and I think you
25 would agree with me, we would ask First Nations how and

1 if they want to be involved.

2 So, I think then it would be worked out
3 in the sense of what type of studies, what type of
4 consultation would be appropriate.

5 So we would always go out with that sort
6 of openness an approach to designing whatever the
7 studies in the consultation would be.

8 MR. BANCROFT-WILSON: A. And through
9 that process, in terms of respective roles in
10 decision-making, if those are to be redefined or
11 recharacterized for the project, that would happen as
12 that time, as is happening, I guess, in the Moose River
13 Basin; there is a whole dialogue on what that
14 co-planning is going to be about, what it means to
15 different people.

16 We are just telling you how we have
17 defined it in our project and I spoke the other day
18 about "the veto right" of any one group and I have
19 talked about how we have done it over the years in
20 transmission.

21 So, that is all we can really speak to,
22 what will happen in other processes, as other things
23 become defined, as projects become defined; we really
24 can't comment on.

25 Q. All right. Thank you. I have a few

1 questions on the issue of costs of transmission lines.

2 Dr. Tennyson, if you could look at page
3 5A. If this is a question more appropriate for Mr.
4 Bancroft-Wilson, whichever one would like to answer it.

5 In the answer to the interrogatory,
6 reference is made to reserve lands and that
7 acquisitions will not be carried out unless there is a
8 willing seller or a willing buyer; is that correct?

9 A. It says, "are carried out on a
10 willing seller/willing buyer basis; the point making
11 the distinction between Ontario Hydro does not have the
12 right to expropriate federal lands.

13 Q. All right. The answer to the
14 interrogatory then goes on to describe how Ontario
15 Hydro receives easement rights.

16 If you look halfway through that first
17 paragraph, settlements are generally for a specific
18 term, such as 20 years, with renewal provisions.
19 Provision is made to re-examine market value
20 periodically, usually every five years.

21 Is this a description then of a typical
22 settlement that would be made?

23 A. This is more of a description of a
24 typical type of process that is used for acquiring
25 rights across the federal native lands.

1 Q. Okay. I would like you to look at
2 the next page, page 5B, which is Interrogatory 7.21.1,
3 which discusses Ontario Hydro's process -- sorry.

4 THE REGISTRAR: That will be .115.

5 MS. MARLATT: Thank you.

6 MRS. FORMUSA: I think it is 7.27.1.

7 THE REGISTRAR: 7.27.1, yes.

8 THE CHAIRMAN: What about 7.10.135
9 which is the one on the previous page?

10 MS. MARLATT: Yes, we need a number for
11 that. I am sorry.

12 THE REGISTRAR: Which one do you want
13 first?

14 MS. MARLATT: 7.10.135.

15 THE REGISTRAR: Then we will give that
16 115.

17 ---EXHIBIT NO. 434.115: Interrogatory No. 7.10.135.

18 THE CHAIRMAN: All right.

19 MS. MARLATT: Thank you.

20 THE REGISTRAR: 7.27.1 is 116.

21 THE CHAIRMAN: All right.

22 MS. MARLATT: Thank you.

23 ---EXHIBIT NO. 434.116: Interrogatory No. 7.27.1.

24 MS. MARLATT: Q. I believe that this
25 answer also refers to the process for negotiating

1 permits for the right to construct, operate, maintain
2 high voltage transmission lines across reserve land.

3 Now, in this answer, the description is
4 that permits are taken in perpetuity, payment can take
5 one of two forms: A lump sum payment when the permit
6 is granted or an annual payment which is renegotiated
7 every ten years.

8 Mr. Bancroft-Wilson, is this a different
9 process?

10 MR. BANCROFT-WILSON: A. No. It is the
11 same. It is attempting to describe the same process.
12 It has been written slightly differently in that it has
13 illustrated a couple of different points.

14 First of all, the rights are taken in
15 perpetuity and that is not reflected in the initial
16 response in 7.10.135. 7.10.135 focuses on the
17 settlements; that is, in other words, the monies that
18 are paid. And it says for a specific term with renewal
19 provisions. That means that the payment period for the
20 amount that is to be paid is generally for a certain
21 period and it had has to be renegotiated.

22 That is more or less consistent with the
23 second one which says a lump sum payment for the permit
24 is granted or an annual payment which is renegotiated.
25 In this case, they have used every ten years. I think

1 those terms can vary.

2 So it is trying to describe the same
3 process, but I agree the wording is somewhat different
4 and perhaps confusing.

5 Q. All right. Is the process any
6 different for permits that involve reserve land and
7 permits that involve non-native lands, private
8 property?

9 A. If you characterize this as an
10 easement - it is not an ownership of the land. It is
11 an easement or permit - it is generally similar, yes.
12 The rights, again, on private land, easement rights on
13 private land are taken in perpetuity. There is an
14 option for a lump sum payment at the time the easement
15 is taken or there is a provision for annual payments.

16 The annual payment essentially takes the
17 amount of the settlement and applies an interest rate
18 to that and the amount is paid out every year based on
19 the principle sum which is kept by Ontario Hydro.
20 Those also have provision for renewal review based on
21 current market values every five years.

22 Q. Do the easements taken in perpetuity,
23 do they also have a provision for renegotiation on
24 market prices?

25 A. Yes, they do, the newer ones. The

1 ones taken many, many years ago don't, but ones taken
2 in the last probably 10 to 15 years, the policy has
3 been to -- if the annual payment method is taken and
4 there is a provision, to review it every five years,
5 and that is an advantage to some people especially if
6 you are in an area where market values may be
7 increasing or land uses may be changing and the highest
8 and best use in the land may change and increase the
9 value significantly.

10 Q. And the market value form of
11 determining the payment, how do you do that with
12 reserve lands?

13 A. Well, that is done through, as I
14 described the other day, it is done through a similar
15 approach to acquiring any rights on private lands or
16 public lands, an appraisal is conducted to try to
17 establish the "market value" of the land.

18 Obviously on reserves, the land is not
19 actually sold. It is not actually sold from one person
20 to another. People acquire it, I understand have
21 rights to it for as long as they want it, so you need
22 to use some means to establish the value of those lands
23 on the reserves.

24 And so what would happen is you would
25 look at similar types of uses in the surrounding area

1 and that is done through appraisals and consultation
2 with Indian and native affairs and the band.

3 Q. Now, with municipalities, I
4 understand that grants in lieu of taxes are taken by
5 the municipality for transmission lines running across
6 a municipality; is that correct?

7 A. That is correct with respect to where
8 Ontario Hydro owns the land, okay? So if Ontario Hydro
9 actually purchases the land, Ontario Hydro as a Crown
10 corporation, government agent doesn't pay taxes. So
11 what we do is calculate an amount equivalent to the
12 business tax that would be paid on that land and we
13 would pay that to the municipality as a grant in lieu.

14 That is not done though on an easement
15 and the majority of our lines are held under easement;
16 the simple right being that the easement, the land,
17 ownership of the land remains with the owner. It is
18 just subject to an easement by Ontario Hydro.

19 MS. MARLATT: All right. Thank you.

20 Would you like to take a break now?

21 THE CHAIRMAN: All right. We will take a
22 15-minute break.

23 THE REGISTRAR: This hearing will recess
24 for 15 minutes. Please come to order at the back.

25 ---Recess at 11:31 a.m.

1 ---On resuming at 11:50 a.m.

2 THE REGISTRAR: Please come to order.

3 This hearing is again in session. Please be seated.

4 MS. MARLATT: Before I continue with my
5 cross-examination, I would like to introduce to the
6 Board Mr. Keith Lewis, he is the environmental
7 coordinator for the North Shore Tribal Council.

8 Q. Mr. Bancroft-Wilson, this question
9 may be directed at you. Does Ontario Hydro acknowledge
10 legal and financial responsibility for damages that
11 occur to transmission lines in the province?

12 MRS. FORMUSA: I am not sure that is a
13 question that witness should answer.

14 THE CHAIRMAN: I am not sure what it
15 relates to.

16 MS. MARLATT: Well, perhaps I could ask a
17 more specific question and you can determine that.

18 Q. I am particularly interested in what
19 happens if a line that is crossing a reserve goes down
20 for any reason, whose responsibility is that in terms
21 of cost? Is that part of Ontario Hydro's cost for
22 transmission lines or part of the reserve's costs?

23 MR. BANCROFT-WILSON: A. No, the repair
24 of transmission lines, those costs are borne by Ontario
25 Hydro.

1 Are we talking here for storms or
2 something like that?

3 Q. Precisely.

4 A. That's part of Ontario Hydro's
5 maintenance budget.

6 Q. All right. So even though a line
7 goes through an easement on a reserve, Ontario Hydro
8 would send people up to fix it and those would be part
9 of their costs for that transmission line?

10 A. Yes, that's correct.

11 THE CHAIRMAN: I am not quite sure what
12 the implication of the question is. Is there something
13 I am not following here?

14 It would seem to me if the line went down
15 it is Ontario Hydro's responsibility to fix it.

16 MS. MARLATT: That would be my
17 understanding, too. It's actually out of an incident
18 that happened in Northern Ontario on a reserve, which
19 is not part of our evidence, but would be part of
20 Treaty #3 and NAN's evidence, where the costing was not
21 so clear who was responsible, and I just wanted to see
22 what Ontario Hydro's policy was on that. But obviously
23 it is what my understanding was, which is, if it's
24 Ontario Hydro's line they take care of the cost for it.

25 MR. BANCROFT-WILSON: We were talking

1 about a storm. Are you suggesting there was some
2 question about why the line went down, whether it was
3 vandalism or something like that.

4 MS. MARLATT: Q. No. In this case I
5 would just like to go with it definitely being
6 something that was not the responsibility of any
7 individual.

8 MR. BANCROFT-WILSON: A. As I said, if
9 it goes down through a storm, the maintenance of
10 transmission lines, that's part of the operating and
11 maintenance budget.

12 THE CHAIRMAN: I think it is extremely
13 unlikely, but if some individual or person was
14 responsible for the breakdown, then I suppose Hydro
15 would be able to seek compensation from them. But the
16 initial responsibility for fixing the line would be on
17 Ontario Hydro.

18 MR. BANCROFT-WILSON: Yes, that's
19 correct, Mr. Chairman.

20 MS. MARLATT: Thank you.

21 Q. I have some planning questions for
22 Dr. Macedo, and I would like to look at page 7 of our
23 exhibit. This comes from the 1988 Bulk Electricity
24 System Transmission Report. So, it's page 24 of
25 Exhibit 29. The second paragraph states:

1 The report emphasizes the importance
2 of achieving an appropriate geographical
3 balance of supply and load.

4 So, Dr. Macedo, from a planning
5 perspective, regional balance of supply and load is an
6 important planning principle; is that correct?

7 DR. MACEDO: A. Yes, it's an important
8 planning principle. It's one of the principles. There
9 are many other principles.

10 Q. All right. But is this one of the
11 important planning principles? Would you agree that it
12 is?

13 A. Location of generation to achieve a
14 geographic balance is an important consideration.
15 There are other factors that have to be taken into
16 account in determining the best location for generation
17 and they include proximity to the transmission system;
18 they include the amount of transmission that would be
19 required to incorporate that station, and obviously the
20 better the balance, the less of that transmission; it
21 includes a consideration of losses on the system.
22 Those are sort of the transmission planning type of
23 considerations.

24 Beyond that there are considerations
25 today with the technical, geotechnical, cooling water,

1 land requirements, and no doubt social and
2 environmental implications.

3 So, there are a lot of factors that one
4 takes into account in arriving at the best location for
5 generation. This is looking at it purely from a
6 transmission system point of view.

7 Q. Dr. Macedo, that was my
8 understanding. The report goes on to say that the
9 reason this is important is that it improves system
10 security for the loss of a critical right-of-way,
11 minimizes transmission additions, reduces losses and
12 improves operational flexibility. Those would be the
13 reasons that this is an important planning principle;
14 correct?

15 A. That's correct.

16 Q. Thank you.

17 A. There is one other thing I would add
18 to this whole exercise here, is that the balance is not
19 fixed over time. There may be a balance, let's say, in
20 terms of peak load. You may have certain generation
21 that matches the peak load in that area, if that
22 generation is base-loaded and the load has a low
23 capacity factor, then that part of the province or that
24 area ceases to be a balanced area, because now you have
25 got excess generation of a load.

1 So, the type of generation also affects
2 the balance and the load shape affects the balance.
3 This is stated in a very simple form, and I thought I
4 should make that clear.

5 Q. Thank you.

6 Dr. Macedo, one of the long-term reasons
7 for a transmission corridor through Northern Ontario
8 that you discussed in your testimony appeared to be the
9 needs of the west system for a transmission line; is
10 that correct?

11 A. That's correct.

12 Q. Is there any documentation that
13 compares a transmission plan that would be just to meet
14 the needs of the west system, compared to a
15 transmission corridor with its primary goal to meet the
16 Manitoba Purchase needs? Is there a document that
17 compares those two items?

18 A. There is a report that considers
19 supply to the west system, and I think it was attached
20 to Interrogatory 7.10.100, that's a Northern Ontario
21 transmission planning report.

22 There isn't a report that shows how the
23 Manitoba Purchase, Manitoba transmission would satisfy
24 the west system needs. But I think it follows from the
25 earlier report in that if you have a transmission line

1 going through the west system to the east system with
2 transformation at Lakehead, you essentially have the
3 supply to the west system that you would get if you had
4 a line going from Timmins to Lakehead, so it serves the
5 same purpose. There is no report that goes through all
6 this in that level of detail.

7 Q. I think I am looking back a step from
8 whether or not it suits the purpose to what the
9 question was. And you chose not to ask for an approval
10 to improve the transmission system in the North. You
11 asked for an approval for lines to incorporate the
12 Manitoba Purchase, which also may help out the west
13 system; correct?

14 A. That's correct. Those details to
15 serve the other purposes, which is to integrate the
16 east and west system, supply the load in the west
17 system, and so on, would be fully considered in the
18 project-specific environmental assessment for that
19 line.

20 Q. Okay, thank you, Dr. Macedo.

21 Would you agree with me, though, that
22 depending on the undertaking you choose as a planning
23 principle, you may have different criteria, different
24 alternative methods and different alternatives too
25 depending on the you undertaking you choose to request.

1 So if you choose to request an undertaking for
2 something to incorporate the Manitoba Purchase, you may
3 be talking about different criteria and different
4 alternative methods than if you choose to ask for an
5 undertaking to help out the west system needs?

6 A. Theoretically, yes, but in planning
7 the system we looked for all opportunities to make use
8 of that transmission line. And so we say, here is a
9 line that's going through the west system from the
10 Manitoba border to the east system. We know that the
11 west system needs supply in the first decade of the
12 2000s. What opportunities are there to make use of
13 that line to supply the west system, we would obviously
14 consider that.

15 So where theoretically you can separate
16 these things, in practical terms the only logical thing
17 is to combine them.

18 Q. Dr. Tennyson, would you agree, then,
19 that the social criteria that you might be looking at
20 for an undertaking to incorporate the Manitoba Purchase
21 will be the same type of criteria that you would look
22 at for transmission lines just for the west system?

23 DR. TENNYSON: A. If you mean in terms
24 of the types of factors and evaluation criteria we
25 would use--

1 Q. I will give you an example.

2 A. --yes.

3 Q. You would agree with that?

4 A. Yes.

5 Q. It would be the same?

6 A. Well, similar, yes.

7 Q. Dr. Macedo, is there any technical
8 reason that the Manitoba Purchase transmission lines
9 could not go through the United States and up into
10 southern central Ontario?

11 DR. MACEDO: A. Of course you wouldn't
12 meet the west system needs that way and you would have
13 to build transmission to supply the west system.

14 Ignoring all of that, and ignoring the
15 implications of going through the United States,
16 assuming that you have 1,000 megawatts coming in
17 through Michigan and New York, we would have to
18 reinforce the system within southern Ontario to enable
19 us to do that. And assuming that we can reinforce the
20 system in southern Ontario, it's an option.

21 Maybe Mr. Huggins may wish to add
22 something to that response.

23 MR. HUGGINS: A. The only thing I could
24 add to it would be that I think it would be, first
25 order, a piece of business to get regulatory approval

1 - for transmission through the U.S. in another
2 jurisdiction. I can't give you any details, but I
3 would think you are into very major difficulties.

4 Q. But technically your answer is yes,
5 technically it could be done.

6 A. Technically you could build wire
7 anywhere you like.

8 Q. Thank you very much.

9 Dr. Macedo, moving on to some more
10 general questions. Can you tell me what the capacity
11 of the Mississagi to Hanmer line is right now?

12 DR. MACEDO: A. The line is operated at
13 230 kV.

14 Q. And at this time how much more
15 non-utility generation can that line take?

16 A. I think I would look at the whole
17 interface which is that line plus the underlying 230
18 kV.

19 The existing system can incorporate
20 between 250 to 400 megawatts of non-utility generation
21 between the Algoma and Sault Ste. Marie areas.

22 Q. It's the intention to add a second
23 500 kV line along the existing right-of-way; is that
24 correct?

25 A. We do have approval to add a second

1 line. There are studies going on now to determine when
2 we might add that second line.

3 Q. All right. If you added that second
4 line, what would the capacity of those lines be at that
5 point for non-utility generation in that area?

6 A. We don't know. We are looking at
7 lots of options in that area and they include upgrading
8 the 230 kV lines; they include reconductoring and
9 reinsulating the existing line between Hanmer to
10 Mississagi for operation at 500, because you do that
11 first before building another line because you try and
12 maximize the use of our existing facilities first.

13 There are a lot of options that we are
14 looking at and until we go through those options and
15 evaluate, really, I couldn't tell you.

16 Q. All right. Could you tell me then,
17 is there any change in the options that you are looking
18 at as a result of the changes in approvals for the
19 North Shore? The information I am looking for is,
20 without a fossil or nuclear plant on the North Shore in
21 the near future, would you still be looking at adding a
22 line up there?

23 A. That is a possibility, yes.

24 Q. My other question, Dr. Macedo, is
25 with regards the Hanmer to Toronto line. It's my

1 understanding that the third 500 kilovolt line is still
2 proceeding, that study; is that correct?

3 A. Yes, the study is proceeding.

4 Q. Would that line still be needed if
5 the Manitoba Purchase did not need to be incorporated
6 into that system, the third line?

7 A. There are a number of things that
8 require the third line. You have to look at the
9 Manitoba Purchase, hydraulic developments in the North,
10 non-utility generation in the North. So, unless I know
11 all the other assumptions you are making, for instance,
12 if the Manitoba Purchase is not pursued, what else
13 would be pursued? Will you pursue more NUGs? And if
14 we did pursue more NUGs, would that be in the North?
15 And if it is the North, then you have got your 1,000
16 megawatts there. So there are many options.

17 Suppose none of these options
18 materialize, no hydraulic, no Manitoba, no NUGs, our
19 estimate is that we need the third line for supply
20 North, okay, to supply Northern Ontario.

21 You add NUGs in the north that can defer
22 that third line, or you add the Manitoba Purchase and
23 that can also defer the third line. You put the two
24 together and that advances the third line. So, it's a
25 complex relationship between all these resource

1 developments and we think it is prudent planning to
2 carry out these studies now so that we are in a
3 position so we can reduce lead times should we need to
4 proceed with that plan.

5 Q. So, the changes in approval for
6 nuclear and fossil have not changed any other plans for
7 the third line between Hanmer and Toronto?

8 A. That's right. We are proceeding with
9 the studies for the third line.

10 Q. Dr. Macedo, you have provided us with
11 the rights-of-way widths for different voltage lines,
12 and I was wondering what the rights-of-way are for a
13 115 kilovolt line?

14 A. I think Mr. Bancroft-Wilson perhaps
15 should answer this.

16 Q. Mr. Bancroft-Wilson?

17 MR. BANCROFT-WILSON: A. Frankly, I am
18 not involved in planning. I haven't been involved in
19 planning too many of those. They vary, because a lot
20 of those lines are very, very old. I would say
21 anywhere probably from 60 to 120 feet, 100 feet.

22 DR. MACEDO: A. We have a number of 115
23 kV lines on 66-foot rights-of-way. They are the very
24 old lines. In fact, the original lines that were put
25 in around 1910 were on 66-foot rights-of-way.

1 I don't know what the current width is,
2 but I think the range that Mr. Bancroft-Wilson gave is
3 fair.

4 Q. Mr. Bancroft-Wilson, I have some
5 questions for you. If you turn to page 11 of the
6 package that I have given to you, and that's from the
7 transcript page 17540, Volume 100. And at line 9 to
8 line 19 you refer to problems with potential for
9 erosion around the Nipigon River. This is an existing
10 problem in the area; is that correct?

11 MR. BANCROFT-WILSON: A. Yes, this is a
12 site-specific soil condition in that section of the
13 river which has been a difficulty for other utilities.

14 Q. And is it your understanding that the
15 incorporation lines would have to go across the Nipigon
16 River?

17 A. In the schemes that we are proposing
18 now they would have to cross the river, but not
19 necessarily in that specific spot.

20 Q. Thank you. Are there any other
21 mitigation or alternative methods that you would use in
22 that type of situation where you are having erosion
23 problems other than avoiding the area?

24 A. Yes, there are various measures that
25 you could employ, some being just ensuring that you

1 retain existing vegetation. A lot of them would be --
2 I am talking about how you go about preventing it in
3 the first place, and if it occurs what you do.

4 So the initial prevention if you are
5 going through an area would be to leave as much of the
6 existing vegetation on the right-of-way to stabilize
7 the right-of-way when you remove the taller vegetation.
8 [12:10 p.m.]

9 If you get erosion incurring in spite of
10 that, then there are various mechanical means that you
11 can use. You can place blankets on it to construct
12 erosion control structures. You can try and
13 re-establish or replant vegetation, hydro seed, which
14 is spraying a blanket of foam which contain seeds which
15 will germinate very quickly, erosion blankets. So
16 there are various things that you can do depending on
17 the circumstances.

18 Q. Okay. If you could look at page 12
19 now, which is Interrogatory 7.10.65, which I am going
20 to get a number for.

21 THE REGISTRAR: That has previously been
22 entered, Mr. Chairman, .68.

23 THE CHAIRMAN: Thank you.

24 MS. MARLATT: Thank you.

25 Q. From the answer to this

1 interrogatory, it is clear that the wildlife impacts
2 were not considered in relation to the purchase option,
3 correct?

4 MR. BANCROFT-WILSON: A. Yes, that is
5 correct. I think we went through it in the plan
6 analysis. There was no mention of wildlife impacts and
7 I think I acknowledged that that is something that
8 should have been recognized.

9 Q. So right now in this hearing, we
10 don't have any information to compare wildlife impacts
11 from building extensive transmission lines through
12 Ontario compared to potential wildlife impacts
13 resulting from non-utility generation or hydraulic
14 facilities; is that correct?

15 A. I don't believe that we have got any
16 information to that level of detail between the
17 alternatives. I think wildlife impacts, of course, are
18 mentioned in some of the other options. And through my
19 direct evidence, I think I gave a characterization of
20 the types of effects and impacts that could be on
21 wildlife. So I think it is now, you know, before the
22 hearing board, a similar type of information.

23 Q. So is there any other documentation
24 other than your own evidence on that matter?

25 A. There are interrogatories that have

1 been filed, some studies on impacts on wildlife from
2 herbicides, things like that. There has been some
3 material filed through interrogatories. I am not sure
4 if those have all been put into evidence or not.

5 Q. Okay. And it is your understanding,
6 Mr. Bancroft-Wilson, that that comparison will not
7 occur at the Manitoba Purchase environmental
8 assessment?

9 A. Which comparison are you talking
10 about?

11 Q. The comparison between wildlife
12 impacts from a purchase compared to wildlife impacts
13 from hydraulic.

14 A. The project-specific hearings for the
15 transmission facilities to seek a final approval of the
16 transmission facilities to incorporate the purchase
17 will, in my understanding, be dealing with alternative
18 ways of locating and constructing those facilities,
19 will not be looking at options such as hydraulic.

20 Q. All right. Thank you. All right.
21 Looking at page 15, and I should tell you this comes
22 from Interrogatory No. 7.6.45.

23 A. Ms. Marlatt, if I just might--

24 Q. Yes?

25 A. --just one thing on the wildlife: We

1 talked about documentation and I guess I should have
2 indicated that the one piece of documentation that has
3 been filed is the environmental guidelines for
4 construction of transmission lines.

5 In those guidelines, it does go through
6 impacts on such things as wildlife, as well as a range
7 of things I covered in my testimony, and impact
8 mitigation measures are discussed in there and the
9 various things that are done and other reports that
10 have been put in as part of the right-of-way management
11 policy such as Raptor nest relocation programs.

12 So those things have been entered through
13 various interrogatories, but certainly, the
14 environmental guidelines for construction and
15 maintenance of transmission lines have been put into
16 evidence and do contain some considerable amount of
17 information on wildlife.

18 Q. All right. But there is no
19 comparison document that would compare the impacts from
20 a purchase option to other supply options?

21 A. As far as what is in the analysis of
22 the other options, I know that there is some discussion
23 of wildlife impacts in there.

24 You were making the point there was no
25 basis on which the Board can make a comparison and I

1 guess I was just suggesting that there is some
2 information now in evidence other than my direct
3 testimony that indicates the types of impacts from
4 transmission that may be anticipated on wildlife.

5 Q. But that is not comparative data,
6 correct?

7 A. No.

8 Q. All right. Thanks. All right.
9 Looking at page 13 of our exhibit, which is
10 Interrogatory No. 7.6.45.

11 THE REGISTRAR: Was previously entered,
12 Mr. Chairman, .47.

13 THE CHAIRMAN: Thank you.

14 MS. MARLATT: Q. All right. Attached to
15 this interrogatory was a document with its front page
16 on page 14, the Ontario/Manitoba Interconnection
17 Project, scope of work. And the next page is page 15,
18 which is actually page 33 of that report.

19 And I know that you have answered quite a
20 few questions on the timing of the Manitoba Purchase,
21 so this will be quite short. This report identifies
22 key events and the completion dates for key events.

23 Mr. Bancroft-Wilson, could you tell me
24 where we are in those key events in timing of this in
25 January of 1992?

1 MR. BANCROFT-WILSON: A. The first thing
2 I should say is that this was prepared as we started
3 the study in late 1990. It was issued as a draft and
4 then finalized January 7th, 1991. So the dates in here
5 have, in fact, changed significantly in some cases.

6 Where we are now is in the process of
7 selecting the preferred routes and sights. We have
8 identified, as I indicated before, preferences in some
9 areas. In other areas, we are still examining
10 alternatives. And we are still obviously working with
11 various groups in terms of collecting information to
12 complete our assessment. So we are in that phase.

13 We are still doing evaluations, but in
14 some cases, we have indicated our initial preference
15 for routes and sights.

16 Q. All right. Do you have a new
17 timetable for when that would be completed?

18 A. Our timetable right now, as I
19 indicated previously, is we are hoping to produce a
20 draft environmental assessment which will contain some
21 of the information or a good deal of the information
22 that we expect to have in the final one, a lot of the
23 work leading up to the stage we are at right now. We
24 hope to submit that sometime in the spring for review
25 by agencies, government agencies, and participants in

1 our study, including the First Nations that have been
2 involved with us and other Aboriginal groups.

3 The final date for the submission has not
4 yet been determined. We are still looking at that in
5 light of the ongoing studies, work that needs to be
6 done, studies with Aboriginal communities and
7 non-Aboriginal communities, but we are projecting
8 something late summer, perhaps early fall, but that
9 date is not yet finalized.

10 Q. All right. So you may have, in fact,
11 answered one of my other questions, which was, the
12 draft environmental assessment will then be circulated
13 to the First Nations.

14 Is it circulated at the same time as it
15 would be circulated to government agencies?

16 A. Sorry, run that by me again.

17 Q. Okay. The draft environmental
18 assessment, I believe you said, would be circulated to
19 First Nations.

20 A. Yes, to those First Nations that are
21 working with us in the studies, that is correct.

22 Q. All right. So when you complete your
23 draft EA, you will circulate it to government agencies.

24 Will you circulate it at the same time to
25 the First Nations?

1 A. We will be discussing it, the content
2 of it, with respect to First Nations probably prior to
3 that, in the preparation of it. We have had some
4 discussion already, but it will go simultaneously.

5 DR. TENNYSON: A. The actual draft and
6 would it be released, it would go at the same time, but
7 as Mr. Bancroft-Wilson has indicated, we would, of
8 course, be discussing what is in it, the contents, and
9 what should be in it with First Nations that we are
10 working with it prior to it going anywhere.

11 Q. Right. I am just concerned about the
12 actual document itself. It goes out--

13 A. No.

14 Q. --with a letter to the government
15 agency at the same time to the First Nations, right?

16 A. Well, in fact, they might get it a
17 little sooner.

18 Q. Right. Thank you. My last set of
19 questions are on EMF impacts and they are for Dr.
20 Vascotto. I would like to ask you to look at page 16,
21 which is Interrogatory No. 7.10.110.

22 THE REGISTRAR: That is .117.

23 MS. MARLATT: Thank you.

24 THE CHAIRMAN: We haven't had that one
25 before; is that right?

1 MS. MARLATT: No, I don't believe you
2 have.

3 THE REGISTRAR: Not as far as I know.

4 ---EXHIBIT NO. 434.117: Interrogatory No. 7.10.110.

5 MS. MARLATT: Q. The answer to this
6 interrogatory, I would like to ask you to look at the
7 second paragraph, which states that:

8 Given that a public health risk from
9 these fields has not been established and
10 it is not known what exposures, if any,
11 are of concern, meaningful steps have not
12 been taken to avoid control or ameliorate
13 EMF. Because studies on crops,
14 livestock and wildlife have not shown
15 significant effects, no mitigative steps
16 are necessary or appropriate.

17 Do you agree with this answer, Dr.

18 Vascotto?

19 DR. VASCOTTO: A. Given the current
20 state of knowledge, I would have to agree with that,
21 yes.

22 Q. All right. Thank you. On the next
23 page, page 17, you will see a document that I believe
24 you provided in response to Mr. Castrilli's
25 cross-examination?

1 A. Yes, that is correct.

2 Q. Thank you. And this is an article
3 entitled, "Biological Effects of Electric and Magnetic
4 Fields", and was co-authored by Dr. Vascotto.

5 Would you tell us what journal this
6 appeared in?

7 MRS. FORMUSA: I think it was Power
8 Technology as I recall the undertaking to Mr.
9 Castrilli.

10 MS. MARLATT: Yes.

11 DR. VASCOTTO: I have the reference for
12 it - yes, Power Technology International, 1989.

13 MS. MARLATT: Q. Okay. Thank you. On
14 the second page of that report, on page 18 of our
15 exhibit, I would like you to look at the third column
16 at the top where the black line indicates:

17 In 1987, following considerable
18 discussion and evaluation of the
19 available data, it was concluded that
20 there was sufficient evidence of a
21 possible low level risk of increased
22 cancers associated with exposure to
23 magnetic fields to warrant further
24 research.

25 Dr. Vascotto, can you confirm that this

1 is Ontario Hydro's opinion?

2 DR. VASCOTTO: A. In 1987, an
3 epidemiological study was released in the Denver area
4 which found an association, a statistically significant
5 association between wiring codes and childhood
6 leukaemia.

7 Following a series of workshops, it was
8 concluded that more research was needed and warranted
9 to see if this phenomenon, in fact, represented effects
10 from magnetic fields or whether they were due to
11 something else that may be represented by these wiring
12 code criteria. And we did undertake in our undertaking
13 research in that area, so the short answer is yes.

14 Q. So considering the phrase "warrants
15 further study", I would like to ask you to look at page
16 20 of the exhibit, which is Interrogatory 7.17.2.

17 THE REGISTRAR: It is .118.

18 MS. MARLATT: Thank you.

19 ---EXHIBIT NO. 434.118: Interrogatory 7.17.2.

20 MS. MARLATT: Thank you.

21 Q. And this interrogatory as part of its
22 answer provided a list of studies and total study costs
23 that were being conducted on EMF impacts and that is
24 found on page 21.

25 So Dr. Vascotto, was part of the further

1 study that Ontario Hydro did these studies that we find
2 on page 2 of the answer to that interrogatory?

3 DR. VASCOTTO: A. Yes. In fact, the top
4 box under the EMFRAP, those would have been the studies
5 that were proposed as a result of those workshops, yes.

6 Q. Okay. And the earliest completion
7 date that I can see on there appears to be 1992 for the
8 source characterization study.

9 Has that actually been completed yet?

10 A. Some aspects of the studies have
11 been; the data collection and analysis and the early
12 results, yes. That one has, but there is still one
13 part that is continuing and one part will probably be
14 completed at the end of '92. There may be more going
15 on after that.

16 Q. All right. So then we have one study
17 completed at the end of '92 and all of the other
18 studies have completion dates up to 1994, correct?

19 A. That is correct.

20 Q. The point of these studies appears to
21 be to answer some troubling questions about EMF
22 impacts; is that correct, Dr. Vascotto?

23 A. The studies under the EMFRAP umbrella
24 were specifically designed to attempt to see if cancer
25 was in any way influenced by EMF exposure, magnetic

1 field exposures in particular, and whether there was
2 any evidence of a risk within Ontario. That was the
3 original intent of the studies.

4 Q. All right. So Dr. Vascotto, you
5 don't have the results of those studies yet so you
6 can't give us an answer on whether or not there is a
7 connection to cancer at this point in time, can you?

8 A. I do not have the results of these
9 studies, but since 1987, there have been other results
10 in other jurisdictions which have lead to a further
11 clouding of the issue in fact.

12 Q. All right. So you are still waiting
13 though for the completion of these studies to clarify
14 the issues that are the subject of these studies?

15 A. Yes, the objectives of these studies
16 have not been met and will not be met until later.

17 Q. All right. I would like to ask you
18 to look at page 24, which is Interrogatory No. 2.29.12.

19 THE REGISTRAR: .119.

20 MS. MARLATT: Thank you.

21 Q. Dr. Vascotto, can you confirm for me
22 that this interrogatory had attached to it certain
23 reports that were sent out in response to questions
24 from municipalities, school boards and local utilities?

25 DR. VASCOTTO: A. Yes, it did.

1 Q. I assume that it is Ontario Hydro's
2 opinion that these reports are accurate and that they
3 reflect Hydro's thinking on this matter; is that
4 correct?

5 A. Well, we were trying to present a
6 balanced view of what the thinking was at that time
7 that they were issued. We were not trying to represent
8 as one-sided view of the issue.

9 Q. All right. But did you read these
10 reports before they went out?

11 A. Yes, they were read before they went
12 out.

13 Q. All right. And I assume then you
14 found they had a balanced view in these reports
15 overall?

16 A. The group that would handle the
17 release of these reports would be interested in
18 presenting a balanced view, yes.

19 Q. Okay. Looking at page 27 - and I am
20 sorry, you will have to turn it sideways there - under
21 the heading "can we justify doing nothing", I
22 understand this is one of the reports that was provided
23 from the department of engineering and public policy at
24 Carnegie Mellon University; is that your understanding?

25 A. That is correct.

1 Q. Under that heading "can we justify
2 doing nothing", the answer appears to be:

3 Some people answer yes; they argue
4 that nothing is the right response given
5 the scientific ambiguity that exists
6 today. Whether we should do nothing,
7 exercise prudent avoidance or take more
8 dramatic action is not a scientific
9 question. It is a matter of making a
10 value judgment.

11 Would you agree with that, Dr. Vascotto?

12 A. First of all, this report was written
13 in 1989, I believe, and at that point in time --

14 THE CHAIRMAN: Just a moment now. I
15 think perhaps you can give us that, but I think you
16 should perhaps first answer the question because it
17 seems to be a general question.

18 DR. VASCOTTO: Does the question deal
19 with --

20 THE CHAIRMAN: The question is, the first
21 two sentences of the paragraph that Ms. Marlatt read,
22 she wants to know whether you agree with that or not.
23 It is a general principle.

24 DR. VASCOTTO: I would agree that at this
25 point in time, it is a value judgment.

1 MS. MARLATT: Thank you.

2 Q. Then would you agree that at this
3 point in time, it is your value judgment not to
4 consider mitigation effects for EMF?

5 DR. MACEDO: A. At the present time
6 being 1992?

7 Q. Yes.

8 A. Yes.

9 Q. Thank you.

10 THE CHAIRMAN: You were going to say
11 something about 1987 and I interrupted you, so perhaps
12 if you want to say something about that, you can.

13 DR. VASCOTTO: Basically, what I was
14 going to suggest is that there have been a number of
15 indepth reviews particularly dealing with the cancer
16 issue in EMF. There have been some studies that have
17 shown considerable inconsistency in results that were
18 not present at the time that that report was written
19 and there is considerably more information about the
20 relative importance of various sources of magnetic
21 field strengths that were not available at the time of
22 this report, and that those certainly have influenced
23 my position.

24 MS. MARLATT: Q. Dr. Vascotto, looking
25 back though to the interrogatory, this interrogatory

1 was answered in 1991 and these reports were distributed
2 in 1991 as an answer to this interrogatory.

3 Are you saying that for 1991, these were
4 not accurate reports?

5 DR. VASCOTTO: A. Of the published
6 reports which would be suitable for the public, I would
7 think these are very good reports, but I am saying that
8 in the technical literature, there is further
9 information out now than is covered in these reports.

10 Q. All right. But you are not providing
11 any information from 1989 to 1992 to the public?

12 A. I am afraid I can't answer that
13 question because I am not 100 per cent sure what is
14 included in the communication packages that the
15 particular department responsible for this does at the
16 present.

17 Q. Well, I would like to know if there
18 is anything other than these reports that goes out from
19 Ontario Hydro in response to questions on EMF as a
20 general mailing.

21 MRS. FORMUSA: I have had a lot of
22 experience with this since I used to work in that
23 department. And basically, I mean, we can respond to
24 the extent that if someone asks for a particular
25 technical report, we might even provide that, so it

1 would cover a range. Our answer would be fairly
2 general.

3 MS. MARLATT: Q. But I am not interested
4 in that situation where someone asks for a report.
5 What I am interested in is if you are contacted by a
6 municipality or a school board, as appears to be the
7 case in this interrogatory answer, who says can you
8 send us some literature on EMF, I want to know if this
9 is always what you send them or if there is anything
10 else.

11 DR. VASCOTTO: Q. Very often if
12 technical information is requested, it may be
13 redirected to myself or if it is a medical question, it
14 is redirected to the medical people in the corporation.

15 If it is redirected to me, I try to find
16 out the extent of information that is required. If
17 they indicate they would like to know more specific
18 information, I will indicate where such information can
19 be obtained. That has happened on a number of
20 occasions.

21 Q. All right. But on your general
22 mailing, the school boards and municipalities and local
23 utilities who call you about this question, would you
24 undertake to tell me if there is anything in addition
25 to these reports that you send out?

1 That is when people contact you without
2 specific questions or asking for specific documents.
3 They just call and say, can you send us some
4 information on EMF.

5 [12:30 p.m.]

6 A. I assume that the package that you
7 have will constitute what is mailed out.

8 Q. Will you let me know if that's not
9 correct?

10 A. If it's not correct I will.

11 MRS. FORMUSA: While we are on this
12 interrogatory, just a very small administrative matter.
13 It was given 434.119, but I am advised that it was
14 originally given 434.1.

15 THE REGISTRAR: I am sorry, I cannot hear
16 you.

17 MS. MARLATT: I have 434.1 also.

18 MRS. FORMUSA: 2.29.12, I believe, was
19 originally given the No. 434.1 on your list.

20 MS. MARLATT: The photocopying wasn't
21 clear, but I think you are right.

22 MRS. FORMUSA: So .119 is still open.

23 THE REGISTRAR: That's still open, I
24 apologize.

25 MS. MARLATT: Q. Dr. Vascotto, in terms

1 of reactions to the EMF issue, the three choices that
2 appear in this article are do nothing, prudent
3 avoidance, and aggressive regulation.

4 Are those the alternatives that you are
5 familiar with?

6 DR. VASCOTTO: A. Those are the
7 alternatives I am familiar with, yes.

8 There are other alternatives such as do
9 extensive research in trying to clarify the issue which
10 is one that we are certainly pursuing, to try to
11 understand what is happening out there.

12 Q. I guess the choices I am talking
13 about deal with mitigation.

14 A. Yes.

15 Q. So for mitigation those would be the
16 three choices?

17 A. Yes.

18 Q. Looking at page 30, just for the
19 record I would like to clarify this is still part of
20 the background papers, Biological Effects of Power
21 Frequency Electric and Magnetic Field is the title of
22 the paper, from the Department of Engineering and
23 Public Policy, Carnegie Mellon University. I am
24 referring to page 77 of that report.

25 The second paragraph down states:

1 Up until a few years ago we believed
2 that option one, "do nothing until
3 science becomes better", was preferred by
4 the majority of informed people dealing
5 with this topic. There are still people
6 that argue vigourously for this option,
7 but their numbers are declining both
8 because of increasing suggestive
9 scientific findings, and because of
10 growing levels of public concern."

11 I would like to refer you to page 32 of
12 that report, which is actually page 79 of that report,
13 page 32 in the exhibit materials. And the second
14 paragraph outlines mitigation attempts that would be
15 considered prudent in the context of keeping people out
16 of these fields. A few possibilities include:

17 "Attempt to route transmission lines
18 so that they avoid people; widen
19 transmission rights-of-way; develop
20 designs for distribution systems,
21 including new grounding procedures, which
22 minimize the associated fields; develop
23 new approaches to house wiring that
24 minimize associated fields; redesign
25 appliances to minimize or eliminate

1 fields."

2 I understand some of these areas are
3 outside the control of Ontario Hydro, but for the ones
4 that are within control of the Ontario Hydro, in
5 particular, the first two, is it Ontario Hydro's
6 position that it is not pursuing either of those
7 options at this point in time?

8 A. In terms of the EMF issue that would
9 be correct.

10 However, in designing the lines and in
11 placing the lines, a number of things are taken into
12 consideration. For example, the lines are placed to
13 minimize disruption to the communities, that in fact
14 results in routing the lines so as to minimize the
15 general impact including, as a follow-out of it,
16 magnetic fields impact.

17 In order to meet the guidelines for
18 electric field exposure, we automatically reduce the
19 magnetic field levels in our rights-of-ways.

20 Part of the prudent avoidance that is
21 recommended here clearly states that it has to be
22 affordable and it has to be taken into account, all
23 other things coming into the decision-making process,
24 part of that has to be taken into account. But if you
25 widen the right-of-way you expose a larger area to

1 habitat disturbances or disruptions or whatever you may
2 wish to call them.

3 For example, in these hearings the
4 number of 2 milligauss has cropped up several times for
5 some reason, and our estimates are that a 2 milligauss
6 field would extend the right-of-way on either side by
7 roughly 100 metres, that would result in going from
8 9,000 hectares to 22,500 hectares.

9 In placing the value of taking option No.
10 2, one would have to consider the negative impacts that
11 will be associated to the province, or whatever, of the
12 expanding the rights-of-way because at this point in
13 time 2 milligauss, it means relatively nothing in terms
14 of effects.

15 Q. Dr. Vascotto, I recognize that's your
16 testimony on the matter, but has Ontario Hydro done any
17 written documentation on the issue of potential impacts
18 from Ontario Hydro implementing these mitigation
19 measures, specifically on that issue?

20 A. At the time that I came to these
21 hearings, no such documents were available to my
22 knowledge.

23 MS. MARLATT: Thank you very much. Those
24 are all my questions. Thank you.

25 THE CHAIRMAN: Thank you.

1 Mr. Rodger.

2 MR. RODGER: Thank you, Mr. Chairman. I
3 have one package of materials I intend to refer to in
4 my cross-examination. If I could have the next exhibit
5 number, please.

6 THE REGISTRAR: That will be number 462.

7 ---EXHIBIT NO. 462: AMPCO Cross-Examination Materials
8 for Ontario Hydro Witness Panel 7:
9 Purchase Options and Transmission.

10 MR. RODGER: I have extra copies at the
11 front for my friends.

12 CROSS-EXAMINATION BY MR. RODGER:

13 Q. I have one preliminary matter. If
14 you could refer to pages 1 and 2 of Exhibit 462, panel,
15 and this stems back to some questioning that I had of
16 Panel 2 and it was with respect to the flashover
17 phenomenon that occurs in connection with some of
18 Hydro's 500 kV line.

19 On page 2, starting at line 13, I was
20 asking Mr. Barrie about the research in this area. At
21 lines 18 to 20 he advised me that the latest
22 information he had is that a report would be coming out
23 later this year, which was 1991.

24 I am just wondering if you could advise
25 me. Has that report been finished and released, and if
it has, could you provide me with a copy of it, please?

1 DR. MACEDO: A. The report hasn't been
2 finished. It's in preparation. We expect it to be
3 finalized in early spring and certainly we could let
4 you have a copy of that.

5 Q. Thank you. Now, with respect to the
6 contracts involving Manitoba Hydro, I have few
7 questions of clarification really, and the
8 clarification goes to the amount of power, the timing
9 of the delivery of the power from Manitoba and the need
10 date with respect to getting new transmission.

11 In Exhibit 3 Hydro indicated a rather
12 introductory overview with respect to the Manitoba
13 Purchase, and at the time of that exhibit, which was in
14 1989, Hydro stated that it was beginning to receive the
15 first 200 megawatts of electricity from Manitoba Hydro
16 in 1998.

17 If you go to page 3 of Exhibit 462, and
18 this is taken from Exhibit 3, page 14-8, if you look at
19 the column on the right-hand side of the page with the
20 heading "Manitoba Purchase Option", the first couple of
21 sentences state:

22 "Ontario Hydro contracted with
23 Manitoba Hydro in 1987 a 5-year 200
24 megawatt purchase, starting in 1998.

25 Since that contract was signed,

1 negotiations with Manitoba Hydro have
2 resulted in an agreement to purchase
3 1,000 megawatts over about 20 years at up
4 to 80 per cent capacity factor."

5 Do I understand it correctly that the
6 first 200 megawatt block of power referred to in
7 Exhibit 3 is pursuant to the electricity sale agreement
8 which was signed in 1987?

9 MR. HUGGINS: A. That's correct.

10 Q. And do I understand correctly that
11 when Hydro takes delivery of this first 200 megawatt
12 block in six years from now, then transmission
13 constraints will not be a problem on the Ontario system
14 to accept and distribute this block of power?

15 A. That's my understanding of it, yes.

16 Q. And on pages 4 and 5 of Exhibit 462 I
17 have two pages of excerpts from the electricity sale
18 agreement, and we see over on page 5 that this
19 particular arrangement is to provide 200 megawatts
20 until 2003.

21 There hasn't been any change to that
22 arrangement, has there, Mr. Huggins?

23 A. No, there hasn't.

24 Q. Now, the second contract which we
25 have heard about at numerous points in this panel is

1 the system participation agreement which was signed in
2 '89, and this agreement, of course, provides for the
3 1,000 megawatts of power from Manitoba.

4 On page 6 of Exhibit 462, I have included
5 page 25 of Hydro's Exhibit 433, which shows the staging
6 of the electricity purchase pursuant to the system
7 participation agreement. And tying in this exhibit
8 with the electricity sale agreement, is my
9 understanding correct that the 200 megawatts under that
10 '87 agreement, under the electricity sale agreement, is
11 that 200 megawatts subsumed by the system participation
12 agreement?

13 A. No, they add to each other.

14 Q. They add. So, when we talk about the
15 Manitoba Purchase, and keeping with this page 25 of
16 Exhibit 433, to make it entirely complete would we add
17 another 200 megawatt purchase, another box in 1998?

18 A. Yes.

19 Q. So, when we are talking about the
20 purchase from Manitoba we are really talking about a
21 1,200 megawatt purchase, not 1,000 megawatt purchase?

22 A. The manner in which they stage in the
23 purchase never exceeds 1,000 megawatts total.

24 Q. Now, if I could ask you to turn to
25 page 7 of Exhibit 462, and this is taken from the

1 recently released update, Exhibit 452, and under the
2 column headed Plan Update, approvals requested, we see
3 that the in-service date for the Manitoba transmission
4 is 1999.

5 My question is: Does this in-service
6 date refer to the entire new transmission that is
7 associated with the Manitoba Purchase, or does the 1999
8 date only require that a part of the new transmission
9 system be in place by that time?

10 MR. BANCROFT-WILSON: A. That 1999 date
11 will refer to all the line facilities from the Manitoba
12 border to Timmins and the necessary connection in the
13 Timmins area. It would not include the transformation
14 at Dryden or Thunder Bay in the initial phase for that
15 1999 period.

16 Q. So the in-service is only to Timmins?

17 A. I know Dryden is not. We are just
18 having a discussion whether Thunder Bay is.

19 DR. MACEDO: A. I think Thunder Bay...

20 MR. BANCROFT-WILSON: A. In 1999.

21 DR. MACEDO: A. The Thunder Bay
22 transformation would be follow fairly soon after that.
23 Whether its 1999 or 2000, I am not sure. But certainly
24 you need transformation at Thunder Bay in order to make
25 that AC scheme a workable scheme, because the line is a

1 very long line and you have to sectionalize it to make
2 it work. So I think you should assume that it is going
3 to be in-service in 1999.

4 And I might add that there is also a need
5 for a midpoint switching station between Thunder Bay
6 and Timmins, again to make that scheme work.

7 Q. Now, Mr. Watson touched on this
8 briefly this morning. I am not so entirely clear on
9 it, so let me ask you: As the Hydro transmission
10 network currently exists and if no new lines were
11 added, at what point will transmission limitation pose
12 problems for accepting power from Manitoba?

13 By that I mean, we know that there is not
14 going to be a problem in 1998 when under the
15 electricity sale agreement you start and get 200
16 megawatts. With your answer to my previous question
17 about 1999 having the service in Timmins in place, at
18 what point would it be a problem? Is it 2000 when the
19 first 200 megawatt block comes from the Manitoba
20 Purchase, or is it 2001 whether the 400 megawatt block
21 comes on stream?

22 A. The maximum power we can import from
23 Manitoba on the existing system is 300 megawatts. So,
24 when it exceeds that we need new facilities.

25 Q. So that would be after the year 2000

1 then? In 1998 you get 200 megawatts, in the year 2000
2 you get another 200 megawatts, under the system
3 participation agreement.

4 A. That's when we need it.

5 Q. So, if you could test this in terms
6 of, is there any flexibility with the 1999 in-service
7 date, it would be yes, there is flexibility but it's
8 only one year?

9 A. That's right.

10 Q. I would next like to turn to the
11 issue of lead times. We have heard testimony again
12 earlier today that the lead time for planning
13 construction was estimated at eight years.

14 Am I correct that if you assume that all
15 the required regulatory approvals are given to Ontario
16 Hydro, then it's Ontario Hydro's estimated lead time
17 for putting in place the new transmission system, that
18 lead time is between four and five years? Did I
19 understand that correctly this morning?

20 MR. BANCROFT-WILSON: A. Yes, that would
21 be the construction for the initial facilities required
22 for 1999.

23 Q. That would then mean, if four or five
24 years is the period, that the latest that Ontario Hydro
25 could get site-specific approval for new transmission

1 would be 1994 to 1995; is that correct?

2 A. Yes, that's correct.

3 Q. As Mr. Watson pointed out earlier
4 this morning, certainly your past experience has been
5 that it has taken longer to actually construct the
6 lines, and Bruce was cited as the example?

7 A. I would just clarify that. It has
8 taken longer than anticipated to obtain the approvals.
9 In actual fact, our construction experience with the
10 500 kV lines recently have actually been -- it's been a
11 little bit less. But we have allowed a period in this
12 project, what we think is a reasonable amount to plan
13 for, being such a large project, so hence, four to five
14 years.

15 I should also point out that there, of
16 course, is a year's flexibility in that the contract
17 kicks in in 2000. We planned some flexibility again in
18 that schedule by planning to have it in schedule a year
19 earlier than required, in case for unforeseen reasons
20 throughout the process.

21 Q. Now, what is Ontario Hydro's
22 estimated lead time for Manitoba Hydro to construct the
23 new generation facility and to construct the new
24 transmission network? Again, this is after all the
25 required approvals are given.

1 [12:53 p.m.]

2 A. I think in the material that we had
3 presented through Mr. Shepherd, there were dates in
4 there. I am just trying to think back to -- their
5 in-service date for Conawapa is 2001. That is their
6 current in-service date. Conawapa again, I would point
7 out, the purchase doesn't have to come from Conawapa in
8 those initial years.

9 I can tell you that the start of
10 construction for the Ontario line, as they call the
11 section of the line from Winnipeg to the Ontario
12 border, I believe they plan to start that in about 1996
13 or '97. It is a little over 100 kilometres, 120
14 kilometres. So they have a relatively short lead time
15 to construct that line and they would plan to have that
16 line in place for the commencement of the contract
17 period.

18 Q. So, do I understand that to be that
19 for transmission, after all the approvals are granted,
20 again, you are looking at a four or five year lead time
21 for transmission?

22 A. No, not for their facilities. The
23 point is that they have a lot of float in building that
24 section of the line. As I say, it is a relatively
25 short section of the line. They could probably build

1 that in a couple of years without any difficulty and
2 that is why they are leaving it, the start date, to
3 '97, I believe it is.

4 Q. So that is two years for
5 transmission, construction.

6 And how about to construction for the new
7 generation facility in Manitoba?

8 A. I really can't give you any evidence
9 on exactly what their timing for that is. All I can
10 tell you is what the current in-service date is; it is
11 2001.

12 Q. I would like to find out whether you
13 agree with me on all the potential obstacles or
14 uncertainties that are associated with the Manitoba
15 Purchase and which have the potential, at least, to
16 frustrate that deal from being realized, the first of
17 which, I would suggest to you, is the approval of the
18 Ontario Environmental Assessment Board.

19 Do I understand that for Ontario Hydro's
20 planning purposes, that Ontario Hydro assumed that the
21 requirement and rationale decision of this Board will
22 be handed down in 1992; that, at least, was your first
23 prediction when the Exhibit 3 was released?

24 MRS. FORMUSA: I am not sure how helpful
25 this is. I mean, there have been a number of

1 predictions about when the hearing would start, how
2 long it would take...

3 MR. RODGER: Well, actually, I think Ms.
4 Marlatt's Exhibit 461, if we turn to page 15.

5 THE CHAIRMAN: If anyone can give a
6 definite answer to the question, I would be very
7 interested in it, but I don't know how anyone is going
8 to be able to tell.

9 But I gather that the site-specific
10 process in tandem; is that correct, with this process?

11 MR. BANCROFT-WILSON: Well, certainly the
12 planning studies are under way in tandem with this
13 process. And exactly how the approval process for that
14 site-specific will evolve, I really can't say. There
15 has been a lot of speculation, but that is all it is
16 and that is probably all it is worth.

17 But in terms of a project, managing a
18 project with a lot of people and resources and timing,
19 you know, you need schedules to work to. Schedules are
20 changed and revised and upgraded based on the most
21 recent information, so I wouldn't pick any one date and
22 say, you know, this is the date we are planning to.
23 And if things change with respect to that date, then
24 you can't meet your in-service date.

25 MR. RODGER: Q. Although it is certainly

1 relevant in terms of your planning process that you go
2 through, is that you have to base it on certain
3 assumptions; and if those assumptions turn around to be
4 wrong or are very wrong, that could have implications
5 on in-service dates and so forth and so on.

6 All right. I see that initially you
7 thought there would be decision by '92 from page 15 of
8 Exhibit 461, but I will leave it at that.

9 Certainly, though, that if this Board
10 doesn't find favour with the approval, that would be
11 one way to frustrate the deal. And certainly, once we
12 go on to a site-specific hearing, and that particular
13 board found that the application wasn't appropriate,
14 they certainly could refuse it and that would frustrate
15 the deal as well, wouldn't it?

16 MR. BANCROFT-WILSON: A. Yes, that is
17 possible.

18 Q. Now, if you could turn to page 8 of
19 Exhibit 4.62, and this is AMPCO Interrogatory 7.24.4.

20 THE REGISTRAR: Which is .119.

21 ---EXHIBIT NO. 434.119: Interrogatory No. 7.24.4.

22 MR. RODGER: Q. And in this
23 interrogatory, we asked you about the site-specific
24 environmental assessment.

25 And the last sentence of the answer is

1 that the final environmental assessment document is
2 scheduled to be submitted to the Ministry of the
3 Environment in April, 1992.

4 Could you confirm for me that that
5 scheduling is still appropriate?

6 MR. BANCROFT-WILSON: A. No. I think as
7 I indicated in my answer in response to Ms. Marlatt,
8 that that date has changed and we don't have yet a
9 specific date, but we expect that date will be sometime
10 in the late summer or fall.

11 Q. So that is late summer or fall of
12 1992?

13 A. That's correct.

14 Q. So approval of this Board is
15 certainly an obstacle.

16 A second obstacle or potential obstacle
17 could be the Cabinet review. As I understand the
18 Environmental Assessment Act, the Minister could vary
19 or otherwise change the decision of this Board.

20 And I think you would agree that there's
21 a certain amount of uncertainty there. There may be
22 political considerations that may come to play that may
23 void the deal.

24 Would you agree that that is another
25 uncertainty in this?

1 A. Yes. We are all planners up here and
2 that is what the planning is all about, is trying to
3 deal with uncertainties.

4 Q. All right. I suggest that there is
5 another uncertainty, and that is a potential cumulative
6 environmental assessment for the entire James Bay
7 region.

8 We know from the last panel when I asked
9 questions about that - at least, it is Hydro's
10 position - that the Federal Government hasn't ruled out
11 an accumulative environmental assessment. And it was
12 your evidence that the Federal Government had made
13 requests for information from Ontario Hydro with
14 respect to this matter. And it is also my information
15 that Manitoba Hydro and Hydro Quebec have had similar
16 requests made of them.

17 And to confirm Mr. Bancroft-Wilson, this
18 is a very uncertain process, but I think you would
19 agree that such a cumulative assessment could also
20 potentially result in frustrating the deal; would that
21 be fair?

22 A. That is a possibility. I think you
23 have to recognize that although Federal Government is
24 involved in the environmental assessment process in
25 Manitoba, they have initiated the federal process. The

1 Minister appointed a board along jointly with the
2 Minister in Manitoba, so it is a possibility.

3 And the Federal Government is aware of
4 what is happening in Manitoba and they are involved in
5 a federal review of that project. So, obviously at
6 this point in time, they have made a determination with
7 respect to Conawapa and the approval process is, in
8 fact, underway.

9 Q. Maybe I could just turn to that for a
10 moment, Mr. Bancroft-Wilson, because there again is
11 another uncertainty in this process, is the Manitoba
12 federal review. I understand that process to be a
13 two-stage review.

14 And if you could turn to pages 9 and 10
15 of Exhibit 462, I have included two pages from the
16 Bipole 3 transmission line Henday/Riel report, which is
17 the Conawapa to Winnipeg power transmission complex.
18 And on page 10, which is page 21 of that report, it
19 outlines the two-stage process that is going underway
20 in Manitoba.

21 And perhaps, Mr. Huggins, you could help
22 me with this. It was your testimony earlier on that
23 you expected the Manitoba/Federal Review to commence
24 sometime this month. And I have information that the
25 Joint Board hasn't even submitted its guidelines yet

1 for Manitoba Hydro to submit its undertaking, nor has
2 the Funding Panel held its hearing for funding.

3 Could you correct my information or
4 provide me with more details on your response of a
5 couple of days ago?

6 MR. HUGGINS: A. It depends on what you
7 regard the beginning of the process. I was informed by
8 people in Manitoba that the board, the Joint Board, was
9 going to be starting its work of setting up this month
10 and, of course, there is a process evolving from that
11 before the actual hearings begin, but that was not, I
12 guess, what I had in mind when I answered that question
13 or dealt with that issue.

14 I think Mr. Bancroft-Wilson, I believe,
15 subsequently talked about dates later in the year when
16 they thought the process would actually get to a
17 hearing start in Manitoba.

18 Q. I see from page 10 of Exhibit 462
19 that the Stage 1 process, which, it is my information,
20 is a process that will combine, if you like, the
21 requirement and rationale for both new generation and
22 kind of a generic transmission hearing, they are
23 expecting a decision for corridor approval by early
24 1993

25 If you look below that, the Stage 2,

1 which I take to be the site-specific transmission
2 hearing, they expect a decision by the mid to fall
3 1996, if I can read the time line.

4 Given what you have testified earlier on
5 about lead times, it seems to me from reading this that
6 if Manitoba doesn't get a decision until 1996 and if
7 that decision rejects the deal, wouldn't then Hydro be
8 faced with a situation where it only has four years to
9 look for an alternative supply?

10 MS. PATTERSON: I thought they said
11 mid-1994 for route approval and transmission line
12 construction is followed in 1996.

13 MR. BANCROFT-WILSON: That is the way I
14 would read that. I mean, they have got a box there.
15 The point of the box is mid-1994. Obviously they have
16 tried to indicate a time frame, I think, and not to tie
17 it down.

18 MR. RODGER: Okay. I think that might be
19 right. It is somewhat difficult to read.

20 Q. So in that situation then, mid-'94
21 would be a 5-1/2-year period to find an alternative
22 source should the decision of the Stage 2 panel be to
23 reject the application?

24 MR. BANCROFT-WILSON: A. I think I would
25 have to qualify that. The whole idea of them going for

1 a two-stage process here is to obtain in the Stage 1
2 approval for, as we talked about, the generating
3 station site and its development and the corridors for
4 the transmission. And the reason for that is, that
5 will give them an approvement principle for
6 transmission within that general corridor location.

7 The Stage 2 will set the precise location
8 and impact mitigation, et cetera, impact management to
9 go with that. But they expect by getting a Stage 1
10 approval, they feel they will have approvement
11 principle for a transmission line and Stage 2 will not
12 have the option of rejecting it. So it is different,
13 if you like, from our two-stage process here in that --

14 Q. Oh, I see. So if they get Stage 1,
15 Stage 2 is inevitable?

16 A. That is my understanding of talking
17 to them and why they are proceeding with that. It
18 gives them the approval and then additional time to do
19 the site-specific work on which to fix the location.

20 Q. I see. But it is your understanding
21 that the Stage 2 panel could not thereafter reject the
22 proposal?

23 A. What they can or can't do, I can't
24 speak to. All I know is that in the discussions with
25 the regulatory agencies, that was the approach that was

1 taken and that is why they had the two-stage for the
2 corridor and the routes.

3 MR. RODGER: Mr. Chairman, I see we are
4 close to the lunch hour. I have got about five minutes
5 left of questions.

6 THE CHAIRMAN: Okay.

7 MR. RODGER: Thank you, Mr. Chairman.

8 THE CHAIRMAN: I hope you are a better
9 guesser than Mr. Shepherd was. [Laughter]

10 MR. RODGER: I hope so, too, Mr.
11 Chairman.

12 Q. If you could turn to page 11, please,
13 of Exhibit 462, and this is from Volume 96. I believe
14 this was Dr. Macedo who was responding here and I want
15 to ask a point of clarification.

16 On page 12, which is page 16968, at line
17 5, and you were responding here to questions about the
18 purchase, and your answer was:

19 "At this time and, at least for the
20 near term, it would appear that other
21 than the 1,000 megawatt purchase from
22 Manitoba the possibilities of further
23 firm purchases appear remote."

24 Is my understanding correct with respect
25 to this response, that if for whatever reason the

1 Manitoba deal doesn't go through, then Ontario Hydro
2 certainly will not be able to go out and enter into a
3 further contract for firm power in the amount of 1,000
4 megawatts; is that what you were saying then?

5 MR. HUGGINS: A. I guess I should answer
6 that because that is my testimony, not Dr. Macedo's.

7 Q. I am sorry.

8 A. I guess I would not like to say you
9 could not by 1,000 megawatts to make up for that. It
10 might be difficult to find something as attractive and
11 beneficial in our view as this particular purchase, but
12 given that there are things that can be done on the
13 shorter lead times and there may be surpluses in other
14 areas available at some cost, I don't think it is
15 entirely exclusive that we couldn't find another source
16 for that 1,000 megawatts.

17 Q. But in terms of firm purchases?

18 A. It would be difficult, but I think it
19 is not an impossibility. I think it would get to be
20 difficult and expensive. And there is some risk in
21 going out further, that you might not be able to get
22 the commitment, but I think there is a fair chance you
23 could compensate for the loss of this.

24 Q. Okay. Well, maybe staying with that,
25 Mr. Huggins, I will ask you another question of

1 clarification: Throughout this hearing, my client
2 remains very concerned about Ontario Hydro's
3 contingency plans in case one option doesn't come to
4 fruition.

5 And on page 13 of Exhibit 462, you were
6 responding to a question about what would happen if
7 Manitoba Hydro withdrew from the agreement.

8 I just wanted to read your response from
9 line 5. You respond:

10 Firstly, I guess this purchase is
11 being made primarily for the entire
12 system, not just for the west system, to
13 the extent - and it is a hypothetical
14 situation as far as I am concerned
15 because we do have a contract - we will
16 probably know within one or two years of
17 what the decisions are considering
18 environmental approvals and that provides
19 adequate time to compensate if we have to
20 replace it. It might not be as
21 attractive a purchase or a supply as this
22 is in the overall sense, but I am quite
23 confident we could compensate for it.

24 And then there is the question:

25 So at this point in time, Ontario

1 Hydro hasn't performed any studies as to
2 how needs would be met under such a
3 scenario.

4 And the answer is: No.

5 Do I take that response to mean that if
6 the 1,000 megawatt purchase is lost, as it stands
7 today, Hydro does not have a defined contingency plan
8 about what it would do to replace it?

9 A. That is correct.

10 Q. And would you agree with me that if
11 the deal didn't go through, then a reasonable and
12 likely alternative to compensate for that 1,000
13 megawatts would be to turn to one of the major supply
14 options?

15 A. I don't think I could make that
16 response to your question and I think there are a lot
17 of different options available and we would have to
18 look for the best one and the one that provided what we
19 needed in the time that we needed it.

20 Q. Mr. Huggins, do you believe that
21 since you don't have a contingency plan for the
22 Manitoba Purchase, that this represents prudent and
23 adequate planning for the situation we now find
24 ourselves in?

25 MRS. FORMUSA: Mr. Chairman, I wonder if

1 those questions could now be referred to Panel 10 - I
2 think Mr. Snelson and Mr. Shalaby. We are really
3 getting into the realm of what happens if you
4 substitute one option for another and the option
5 doesn't happen. They would be prepared to deal with
6 those questions.

7 [1:10 p.m.]

8 THE CHAIRMAN: Is that satisfactory?

9 MR. RODGER: That is fine, Mr. Chairman.
10 Those are all my questions.

11 Thank you, Panel.

12 THE CHAIRMAN: We will adjourn then until
13 2:30, at which time I understand the Ontario Public
14 Health Association will be starting. If they are not
15 here, they are not here now, I take it, Mrs. Mackesy
16 will be next.

17 THE REGISTRAR: This hearing will adjourn
18 until 2:30.

19 ---Luncheon recess at 1:11 p.m.

20 ---On resuming at 2:30 p.m.

21 THE REGISTRAR: Please come to order.
22 This hearing is now in session. Please be seated.

23 THE CHAIRMAN: Mrs. Mackesy?

24 MRS. MACKESY: Before I begin my
25 cross-examination I will explain my interest in

1 transmission.

2 My brother, Jim Cullen, is a farmer in
3 Bruce county. He lives about 25 miles southeast of the
4 Bruce Nuclear Power Development, and he is a
5 participate at these hearings.

6 Now, two transmission lines from BNPD
7 already cross one of the farm properties, they are the
8 Bruce to Orangeville and the Bruce to Milton lines.

9 In 1985 and 1986 I attended much of the
10 Joint Board hearing into expanding transmission in
11 southwestern Ontario and out of the Bruce Nuclear Power
12 Development, but I did not participate in these
13 hearings to the extent that I have here.

14 I have prepared a package of
15 interrogatories which I have given to the Clerk, and
16 there are extra copies on the second table from the
17 front.

18 CROSS-EXAMINATION BY MRS. MACKESY:

19 Q. My first questions deal with what is
20 meant by need for transmission.

21 Dr. Macedo, in your direct evidence you
22 outline various transmission considerations taken into
23 account in the demand/supply planning. And in your
24 direct evidence, Mr. Bancroft-Wilson, you described a
25 the first steps in a route-specific environmental

1 process as establishing the need for a project in terms
2 of addressing a particular problem or opportunity.

3 My question is: Am I right in thinking
4 that the transmission need that Ontario Hydro
5 identifies in general planning as in this DSP process
6 and in project planning for a particular route, that
7 that transmission need is established in the context of
8 maintaining an integrated bulk transmission network?

9 DR. MACEDO: A. That is correct.

10 Q. The general purpose of the bulk
11 transmission network has been identified by Ontario
12 Hydro, I believe, as to supply any electricity demand
13 on the network from whatever generation can produce the
14 electricity reliably and economically; is that correct?

15 A. That's one of the purposes.

16 Q. Would you briefly outline the other
17 purposes?

18 A. Yes. There are three other
19 purposes -- maybe there are four.

20 One is to supply the load reliably; the
21 other one is to use existing and committed resources
22 efficiently and economically; the third was to enable
23 power purchases from neighbouring utilities up to the
24 capability of the interconnections for those utilities,
25 and the fourth would be the sharing of generation

1 reserves across the system.

2 Q. Now, I am wondering whether the
3 planners at Ontario Hydro recognized that to a person
4 whose environment is directly and adversely affected by
5 the presence of a transmission line which helps carry
6 out those purposes, would they recognize that he could
7 see the need for the line on his property quite
8 differently?

9 For instance, do they recognize that to
10 such a person the need for a particular transmission
11 line looks to be dependent on whether the people who
12 what the electricity are willing to have the
13 transmission and associated generation built in their
14 own local area rather than in his?

15 A. An integrated system benefits
16 everyone in the province. It ensures low cost because
17 you can share resources across the province, reduces
18 reserves, it improves reliability across the province.
19 So, I would say that no matter where people are
20 located, they benefit from an integrated system.

21 Q. My question following that would be:
22 Would you recognize that some people benefit more than
23 others in that some don't have the transmission lines
24 and still get the benefits, while others do have the
25 transmission lines and have to take whatever adverse

1 impact comes from that?

2 A. Well, those that have the
3 transmission lines affecting their property obviously
4 have certain disbenefits compared to those who don't
5 have the lines on their property. But the lines have
6 got to go somewhere if you have are going to maintain
7 an integrated system. Mr. Bancroft-Wilson can discuss
8 all the steps we take to try and reduce or minimize
9 those impacts.

10 Q. I would be asking questions on that
11 later.

12 MR. BANCROFT-WILSON: A. If I might, I
13 did want to get into that at this point, I seem have
14 questions related to that.

15 I would just like to agree that, yes,
16 certainly the individuals that ultimately have to have
17 the transmission line on their property will suffer
18 some disruption, some disturbance, and often
19 considerable upset during the planning process, a
20 period of great uncertainty for many of them. I think
21 as part of the process one of key things that we have
22 to do is convey and discuss with people the requirement
23 of the facilities.

24 I think one of the biggest challenges we
25 have in planning our facilities are presenting the need

1 to people and having the people feel that there is a
2 feed there. It may not be specifically to supply their
3 individual loads on their farm or their community, but
4 overall there is a benefit for the community or for
5 their part of the province, and that is one of the
6 biggest things for some people to accept, that the
7 facilities are in fact needed.

8 If they don't feel they are needed right
9 the beginning of the planning process, that's something
10 that can be a great impediment to the planning.

11 We have cases whereby we have agreed with
12 the people we are working with it, okay, we don't
13 always agree on need, they may not accept the need, we
14 have agreed that, okay, let's let the Board, the
15 Environmental Assessment Board or the government
16 ultimately determine the need, and people have agreed
17 to work with us on that basis. Okay, we will work on
18 the planning studies with you to find the best location
19 if, in fact, these transmission lines are judged to be
20 needed.

21 But certainly for the individuals, the
22 question of need is probably the first thing that comes
23 into their mind and one of the first things that we
24 have to deal with in the process.

25 Q. Would I be right in thinking that

1 what you are explaining as the justification for need
2 can be quite different from a person who is of the
3 opinion that the line should be located in the local
4 areas of need? Your explanation would not convince a
5 person who is looking at the system from a different
6 viewpoint?

7 A. No. Throughout the planning process
8 we are trying to provide information, share
9 information, and I am saying the acceptance by people
10 that there is a need, there is a justifiable need or
11 tangible need that they can see is one of the things
12 that we have to deal with in the process. Often
13 whether they believe there is a need or don't believe
14 there is a need, that can ultimately affect their
15 participation in this study, and perhaps even how the
16 studies will progress, but it's not essential.

17 We have had studies where we have agreed
18 to disagree on need. So, let's set that aside and
19 leave that for other groups to sort out, or other
20 decision-making bodies to sort out.

21 Often you get down to a supply to a
22 community that's easier for people sometimes to accept.
23 Certainly larger 500 kV transmission lines which carry
24 power a long way, across long distances, often the
25 perception is that they don't benefit directly that

1 area, and I think as Dr. Macedo has said, though,
2 that's not really the case.

3 Q. I believe that Dr. Macedo also said
4 that there is a disbenefit to the people who actually
5 do take the line in comparison to those who don't.

6 A. Yes, there is. Anybody that has a
7 transmission line on their property certainly has to
8 suffer perhaps more of the burden than those that
9 don't.

10 Q. Now, you have been speaking of this
11 in relation to the planning process before the line is
12 authorized and built. Perhaps I could continue on that
13 basis.

14 The planning process you are outlining
15 would eventually result in the selection of -- would
16 this be both generating sites and transmission
17 associated with the sites?

18 DR. MACEDO: A. Yes, there are two
19 different things, as we said. We build transmission
20 lines for other purposes than to incorporate
21 generation. But assuming that we are incorporating
22 generation, then the transmission to incorporate that
23 would be part of the same EA as the generation site
24 itself.

25 Q. In the process of going through this

1 public consultation and the process of planning new
2 generation and transmission, you would eventually
3 before you write an environmental assessment come to a
4 decision on where to recommend sites and transmission
5 routes be located. I would gather from the process you
6 have described that you would go through, that you
7 might come up with a few sites, not any of which might
8 be really in an area of large demand, and the
9 transmission of course would come from those sites and
10 go through areas where there was not large demand.
11 Whereas a person who looks at the need in a different
12 way with the idea that the need should be filled with
13 the generation and transmission in the areas where
14 there is a demand the sites that person would bring
15 forward for approval would be in different areas?
16 Would you agree with that?

17 MR. BANCROFT-WILSON: A. I don't think I
18 can agree with your first premise that the transmission
19 may well be in areas where there isn't demand.
20 Depending on the type of siting facilities you are
21 looking at, if you talking about hydraulic facilities
22 then obviously the majority of the hydraulic potential
23 is in the North. Although if you look at the Beck
24 redevelopment, that's certainly in an area of high
25 demand, it's in the Golden Horseshoe area. If you look

1 at candidate studies that were for nuclear stations,
2 there is Pickering, Darlington, as well as sites in the
3 North Channel.

4 So, I don't think you can characterize it
5 that we are necessarily looking for remote sites.
6 Generally there is a range of things looked at. For
7 any exercise there will be advantages and disadvantage
8 in locating close to load centres.

9 Q. Perhaps we have a different idea of
10 what remote is.

11 When I was saying load centres, I was
12 looking of municipal utilities of large demand. I
13 don't know whether you consider Darlington in such an
14 area or not. Our own personal connection is with Bruce
15 and we don't consider it to be an area of large demand
16 or close to an area of large demand.

17 But leaving that aside, the sites you
18 select would not just be in areas of high demand.

19 DR. MACEDO: A. We go through a fairly
20 extensive site selection process and proximity to load
21 is one factor that is taken into account. But that has
22 to be weighed against all the other factors, and this
23 morning we went through one of some of them.

24 Access to a suitable point on the
25 transmission system because depending upon the size of

1 the station you need a certain electrical strength on
2 the transmission system. You can't connect a station
3 simply to any line that goes nearby; you have got to
4 look to a suitable point on the system. So, that's a
5 factor that has to be considered.

6 We take into account the cost of that
7 transmission, we certainly take into account
8 transmission losses, we look at the flexibility of
9 operating the whole interconnected system and to the
10 extent locating in that site impacts on flexibility.

11 So those are some of the transmission
12 considerations, but they again are only one sub set of
13 all the other factors because there are many other
14 considerations from a generation siting point of view,
15 and that includes factors like suitability of the site,
16 the geotechnical aspects, the cooling water
17 requirements, other infrastructure required to fuel and
18 service the plant and so on.

19 Now, I really can't speak too much about
20 these other factors because my input really is on the
21 transmission side.

22 What we do is that a team is set up that
23 have expertise from these different areas, and we all
24 bring that expertise to bear on site selection, and
25 ultimately the sites are evaluated. And I would assume

1 Mr. Bancroft-Wilson will comment on this, it's likely
2 that transmission routing studies, there is a lot of
3 public input as well in the early stages of site
4 selection.

5 So, it's not as if we go out and we say
6 we are going to site it here. We actually go through
7 this very systematic process of site selection, seeking
8 input across a wide range of expertise within Hydro and
9 from outside.

10 MR. BANCROFT-WILSON: A. I just wanted
11 to add, I don't want to talk about the generation
12 siting, that's probably for another panel or two or
13 three, but just in terms of that the transmission
14 components, Dr. Macedo mentioned some of the technical
15 components, and obviously the social and environmental
16 assessment expects of transmission incorporation is
17 obviously looked at as well, as well as for sites, from
18 a transmission point of view and a site selection point
19 of view.

20 But site selection we are talking about
21 today is not the same as the site selection that was
22 done for the BNPD, there is no bones about that. Many
23 of those things perhaps weren't taken into the account
24 the same as they would be today.

25 Q. Having gone through the process of

1 selecting sites and drawing up the environmental
2 assessment and perhaps taking it to a hearing board,
3 what would be presented in Ontario Hydro's
4 environmental assessment would be what Ontario Hydro
5 thought was the best decision.

6 Is there any way that someone with a
7 different approach can bring an idea to a
8 route-specific hearing board, if the recommendations
9 put forward by Hydro are limited on the considerations
10 that you have outlined?

11 THE CHAIRMAN: Excuse me, I don't mean to
12 interrupt, but I just consulted with Ms. Patterson
13 before I dared to answer this, but there is provision
14 in the Environmental Assessment Act for people who
15 receive notice of the hearing to propose alternatives.
16 So, alternatives are part of the environmental
17 assessment process at the site-specific level.

18 MRS. MACKESY: Thank you, Mr. Chairman,
19 I realize that.

20 I suppose this goes to the matter then of
21 how the notice for the hearing may have been put
22 forward and if the notice limits consideration to
23 certain sites and routes.

24 I would assume that a member of the
25 public with a different view might not be able to bring

1 forward his or her suggestion. So, it brings me back
2 to the point, what is recommended by Hydro and the
3 basis on which the project hearing is put forward
4 clearly narrows the possibility of where the decision
5 for -- clearly narrows the possibility where a site may
6 be eventually located. I will just leave it at that.

7 [2:51 p.m.]

8 Now, I am moving to another area, I have
9 asked a number of interrogatories dealing with a local
10 generation supply plan. Many of these interrogatories
11 were moved to Panel 10, so I don't intend to deal with
12 the responses to those here, but some questions have
13 been answered in Panel 7.

14 Before asking my questions on this type
15 of supply, I will outline how I described the plan in
16 the interrogatories, and I described it as:

17 "A system of increased local
18 generation in the municipal utility areas
19 of need and in rural areas of need in
20 place of expanding the bulk generation
21 and bulk transmission system as Ontario
22 Hydro is proposing.

23 "The present bulk and electricity
24 system will be left in service and the
25 local generating stations would be

1 connected among themselves and to the
2 bulk transmission with local smaller
3 lines."

4 And my first questions deals with the
5 response to Interrogatory 7.29.13 which is on page 2 of
6 the interrogatory package.

7 THE REGISTRAR: That will be 1.20.

8 MS. PATTERSON: .120?

9 THE REGISTRAR: .120.

10 ---EXHIBIT NO. 434.120: Interrogatory 7.29.13.

11 MRS. MACKESY: Okay.

12 Q. The interrogatory question was: How
13 would such a local generation supply plan meet each of
14 the four purposes of the bulk transmission as listed in
15 Exhibit 6 on page 5.1?

16 Now, Exhibit 6 is the plan analysis and
17 the page reference was to page 5-1.

18 Dr. Macedo, you have already referred to
19 the purposes of the bulk transmission system. Would
20 you have anything to add above what you have already
21 said to a question dealing with how a local generation
22 supply plan would meet each of the four purposes or
23 five purposes that you have outlined?

24 DR. MACEDO: A. No. I think the
25 interrogatory is fair.

1 Q. So from that, I gather that your
2 opinion would be that a local generation supply plan
3 would meet the load locally, but that the other
4 purposes would not be well served by such a plan.

5 A. That is correct, with the provision
6 that you have sufficient backup; in other words, you
7 have sufficient generation in the local areas. That
8 generation is going to be more than if you had a fully
9 integrated system.

10 But just make that assumption that you
11 will provide whatever generation is required to supply
12 the local area, then you can reliably supply the load.
13 Now, obviously you still need transmission to connect
14 that generation into the local system.

15 Q. Yes.

16 A. So you are not going to do without
17 any transmission.

18 Q. No.

19 A. What this would allow you to do is
20 avoid the need for major bulk transmission across from
21 one area to another area.

22 Q. I am right then in thinking that
23 Ontario Hydro doesn't think much of this type of a
24 supply system?

25 A. That is a matter for Panel 10.

1 Q. Oh, sorry.

2 A. But my view, is yes, it doesn't think
3 much of this idea.

4 Q. Thank you. Now, you mentioned that
5 your department has over a thousand bulk transmission
6 and regional supply plans on hand.

7 Among those over a thousand plans, are
8 there any plans of the sort I have described, a local
9 generation or transmission plan?

10 A. The plans I was referring to are the
11 transmission plans. The plans that perhaps you had in
12 mind were demand/supply plans.

13 So what we do is we need to supply load
14 in different parts of the province and we have got
15 transmission plans to supply that load. We have got
16 regional supply plans to reinforce the 115 kV system,
17 add more stepdown transformer stations to supply local
18 communities and this sort of thing.

19 The overall Demand/Supply Plan and the
20 alternatives and so on were presented in Exhibit 3 and
21 I think Panel 10 will update that information.

22 Q. All right. I understand that the
23 plans that were presented in Exhibit 3 were selected
24 from a number of plans and within that original larger
25 number of plans I gather you didn't have any plan of a

1 local generation transmission sort.

2 A. It was considered in one of the very
3 early developments of the DSP. I think in '85, '86, a
4 number of representative plans were developed. I think
5 there were 15 plans developed and numerous variations
6 of those 15 plans, but there were 15 basic plans. And
7 one or two - I can't remember right now - of those
8 plans were such a system.

9 Q. Would those be the plans which were
10 characterized as distributed resource plans?

11 A. That's correct.

12 Q. I was under the impression that they
13 were more of a regional nature than purely local
14 supply; would I be correct in that?

15 A. Yes. The basis for those plans were
16 locating 200 megawatt units, okay, so they weren't
17 major stations. They were sort of 200-megawatt
18 stations, if you wish, dispersed across the province
19 so as to avoid major bulk transmission.

20 It evaluated those plans at a very
21 conceptual level and very preliminary cost data and so
22 on, and I think that was reported in one of the
23 exhibits in this hearing.

24 Q. I see. Could you give me the exhibit
25 number?

1 A. Could I undertake to do it after the
2 break?

3 Q. Sure. You mentioned 200 megawatt
4 units being distributed throughout areas. These were
5 not necessarily located in areas of need relative to
6 the 200 megawatt size, were they? And there wouldn't
7 be a greater concentration in a very large urban area
8 as opposed to a thinly populated rural area of those
9 plans?

10 A. Quite honestly, I can't remember all
11 the details. That was a long time ago.

12 Q. Thank you for that. That is
13 sufficient, I think.

14 Now I am moving to a different aspect of
15 transmission. These questions may still be for you,
16 Dr. Macedo.

17 What is the carrying capacity in
18 megawatts of a one-circuit 500 kilovolt line?

19 A. That is a dangerous number to have.

20 [Laughter]

21 Q. May I ask why?

22 A. Let me explain why. A line, a 500 kV
23 line, obviously has a certain current carrying
24 capability and that is determined by the size of the
25 conductor that you put up, okay. And of course, you

1 could put different conductors and so you can get
2 different power transfer capabilities.

3 On our system, because of the terminal
4 equipment at either end and in order to optimize
5 designs and so on, the maximum current is 4,000 amps,
6 and that gives you approximately 3-1/2 thousand
7 megawatts. So to get the power capability, you take
8 the current, you multiply by the voltage and multiply
9 by route 3, and that gives you the capability.

10 But you don't get that capability all the
11 time because of other considerations. Thermal
12 consideration is only one factor. There are stability
13 considerations. There are voltage considerations
14 across the system and there are other very subtle
15 factors that I don't know if you want to go into.

16 So, another factor is how long the line
17 is. If you have got a very long line, then the
18 stability limit of that line is going to be a lot lower
19 than the thermal limit of that line. For shorter
20 lines, thermal considerations may override stability
21 considerations.

22 Then there are factors such as the
23 underlying strength of the underlying system to which
24 it is connected. If you have got two very strong
25 systems and you connected one with the line, 500 kV

1 line, it has a certain capability. If you connect one
2 strong and one weak, there are different capabilities
3 and so on.

4 So I am saying, there are a lot of
5 factors one takes into account, so I don't think you
6 should assume a 3-1/2 thousand megawatt number as a
7 number that you could apply everywhere.

8 In fact, over the last few days, we were
9 talking about the east/west system and I indicated that
10 you build a 500 kV line from Timmins to Lakehead over
11 the existing 230 kV lines; all you get is 200
12 megawatts.

13 Q. In addition?

14 A. Extra, nowhere near 3-1/2 thousand
15 megawatts, okay. So I think that sort of qualifies the
16 number quite well.

17 Q. Is there a rough number you work
18 with? I realize you have said it is a dangerous number
19 to give out.

20 Is there a rough working number closer to
21 the practical number than 3,500 megawatts for a
22 one-circuit 500, which seems quite high?

23 A. Yes. Planning engineers tend to use
24 the natural loading of the line.

25 Q. May I ask what that means?

1 A. Yes. I was going to explain that.

2 Q. Thank you.

3 A. And that is about, I think, 900
4 megawatts. That is the sort of figure I quoted Dr.
5 Connell on the first day of this panel.

6 The natural loading of the line is -- let
7 me explain it this way: When the line is likely
8 loaded, the voltage at the end of the line is higher
9 than the voltage at the sending end. As you load the
10 line up, the voltage at the end of the line begins to
11 drop.

12 The loading that gives you the same
13 voltage at the end of the line as the sending end is
14 called the natural loading of the line. And as you
15 continue to load the line, the voltage drops further
16 and further until you come to the end of the precipice
17 when a small change in load causes the whole system to
18 collapse.

19 Q. Do you have a natural loading for a
20 two-circuit 500 kV line? That is the last capacity
21 number I am going to ask for. I will leave my other
22 questions aside. If you would rather not, then I won't
23 persist.

24 A. Well, you could double it.

25 Q. Okay. Thank you. Now, the Manitoba

1 Purchase line has been described as having something
2 called a design transfer capability, is that correct,
3 the 1,500 megawatts?

4 A. Yes. It is not the line. It is the
5 total interface.

6 Q. Oh, I see.

7 A. So, it is a new line plus the
8 underlying 230 kV. But since the 230 kV has a
9 capability of 300 megawatts, the new line is 1,200
10 megawatts.

11 Q. I am wondering, were there additions
12 of special equipment at transformer stations to produce
13 that size of carrying capacity on the line?

14 A. That's correct. Now, that is a long
15 line and to get a good voltage profile across the line,
16 we have to put on a fair amount of equipment that we
17 wouldn't normally put on, and things like series
18 capacitors is a must on that line to get up to that
19 level. We put in reactors. These are devices that
20 control the voltage across the line, they control high
21 voltages. And we put on static var compensators at
22 terminal stations. This is to provide dynamic control
23 of voltage across the line.

24 Q. You are saying that that is equipment
25 you wouldn't normally put on a line.

1 Could such type of equipment be installed
2 on lines in southern Ontario to increase their carrying
3 capacity of the lines above what there is now in order
4 to avoid building new transmission?

5 A. Yes. We have plans to do that.

6 Q. Are there any developments in
7 transmission technology that look promising as a way to
8 significantly increase the carrying capacity of
9 presently built tower lines which would avoid the need
10 for new lines in the future, any new developments? I
11 have heard of super conductors.

12 A. It won't be in my lifetime.

13 Q. Is there a situation that as long as
14 utilities and society can persuade or make certain
15 segments of the population accept transmission lines at
16 relatively low cost to society, that there is no real
17 incentive to develop anything significantly better or
18 different from what is in use now?

19 A. I am sorry, I missed the first part
20 of that question.

21 Q. Do you see a situation that as long
22 as utilities and society can persuade or make certain
23 segments of the population accept transmission lines at
24 a relatively low cost to society as a whole, that there
25 is no real incentive to develop anything significantly

1 better or different from what is in use now?

2 A. No, I wouldn't say that at all. I
3 think there is a lot of activity going on across the
4 world looking at how best to squeeze the last megawatt
5 out of the system.

6 There is a big project that Ontario Hydro
7 is involved with together with a lot of utilities in
8 the States looking at a technique, if I can call it
9 that. It is not quite that, but let me call it a
10 technique, which has an acronym of FACTS, F-A-C-T-S,
11 and that stands for flexible AC transmission systems.

12 What that does is use semi-conductors.
13 These are electronic devices to dynamically modify the
14 characteristics of the transmission system so that you
15 can get the same benefits out of an AC system as you
16 get out of a DC system.

17 A DC system has tremendous flexibility in
18 its operation and you can push a lot of megawatts
19 through a DC system than you can through a AC system.

20 And so this exercise has got a lot of
21 funding behind it and there are plans to install one or
22 two demonstration projects and we are keeping an eye on
23 these developments obviously.

24 So, there is activity and there will
25 always be activity to try and improve the transfer

1 capability of existing facilities because that is what
2 you would do before you build new facilities because it
3 is more cost effective to start with other than
4 environmental and social and all the other
5 considerations.

6 [3:15 p.m.]

7 Q. The program that you have described,
8 FACTS, when do you think the results of that would be
9 available?

10 A. I think the first demonstration
11 projects are on the design stage, it may even be in the
12 manufacturing stage, but like all new technology you
13 have to give it a fair rundown before you start using
14 it on bulk transmission lines because those are
15 important lines.

16 Until we really see how these facilities
17 perform over extended periods of time under a variety
18 of conditions and so on, I couldn't tell you when we
19 would even consider using them. All I am saying is
20 that it is important that we keep abreast of these
21 developments and make the decision when the time is
22 right.

23 Q. Do you think that time would be
24 beyond the end of the DSP planning period?

25 A. Oh, no, I don't think -- not as far

1 as that. I think beyond 2000, yes.

2 Q. This is moving on to a different
3 section.

4 Dr. Macedo, during the Coalition of
5 Environmental Group cross-examination last Thursday,
6 the Chairman asked you, with regard to transmission
7 planning, whether you were neutral as to what generates
8 the capacity, fossil, nuclear, whatever. And I believe
9 you said that you were but then qualified it with
10 regard to hydraulic generation and the Manitoba
11 Purchase generation which had locational aspects.

12 Now, this is Volume 102, at pages 17900
13 to 17902.

14 A. I remember that part well.

15 Q. You remember that?

16 A. I could have added another two points
17 there, of course, and that is that whether the station
18 is base-loaded or peak-loaded, and that obviously has
19 an impact because that affects when the unit is going
20 to be dispatched and so on.

21 Q. Base-loaded would be characteristic
22 of a nuclear station?

23 A. Yes, it would.

24 Q. And how would that affect it?

25 A. It would affect it in that it doesn't

1 follow the load, and so as the load drops, say, at
2 nighttime, weekends, and so on, there would be --
3 assuming that the area is balanced at peak times, and
4 as load drops at night and weekends there would be
5 excess power in that area that will have to get out to
6 out to supply load elsewhere, and it is base-loaded
7 because it's economic to operate, so, it would be
8 operated.

9 Q. So, the need to get the power out to
10 other areas at night would influence the need for
11 transmission from that?

12 A. It could do, yes, if that causes the
13 interface to be overloaded, yes.

14 Q. Has it been characteristic of nuclear
15 electricity production in Ontario that the generation
16 is concentrated in large amounts on a few sites?

17 A. Sorry, I missed that again?

18 Q. Has it been characteristic of nuclear
19 electricity production in Ontario that the generation
20 is concentrated in large amounts on a few sites?

21 A. If you look at Bruce, yes, it's got
22 eight units, 6-1/2 thousand megawatts out of a system
23 load of 24,000, say, and Darlington is 3-1/2 thousand,
24 so it's not quite that concentrated, and Pickering is
25 4,000 megawatts.

1 Q. So, you agree that a large part of
2 the load is on a few sites?

3 A. Yes.

4 Q. Thank you. Does that mean that the
5 land then around a nuclear site and between the nuclear
6 site and a strong transformer station on the grid is
7 subject to heavy pressure from a demand for
8 transmission routes, because you want to be able to
9 move the power out of the area if there isn't much
10 local demand for it?

11 A. You need transmission to get the
12 power out, yes.

13 Q. And when you concentrate a large
14 amount of power on one site, then you are going to need
15 extra transmission to carry it. You will need more
16 transmission than if it were just a small amount of
17 power?

18 A. It depends how much of that
19 generation is absorbed by the local load in the area.
20 But yes, generally that's right, the more generation
21 you have, the more transmission you need to get it out.

22 Q. Thank you. And when you are siting
23 lines, do you try to site them going different
24 directions for geographic diversity?

25 A. That's one of the important

1 considerations in siting lines, yes.

2 MR. BANCROFT-WILSON: A. However, often
3 in coming out of a generating station there will be a
4 short distance whereby often the lines will be, as you
5 well know, on one right-of-way. And in that case,
6 depending on that distance, they will relax the
7 diversity criteria. But there comes a point where you
8 have to start separating those lines because often they
9 are going in different directions, so obviously at
10 geographic end points they separate, but frequently
11 there is a large right-of-way close to generating
12 station sites.

13 Q. But as you point out, there does come
14 a point where you prefer to separate them
15 geographically?

16 A. Yes.

17 Q. Now, my next question arising out of
18 all of this is: In the case of a site such at the
19 Bruce Nuclear Power Development where there are large
20 bodies of water to the west, that would be Lake Huron,
21 and to the northeast, that would be Georgian Bay, in
22 that situation does adding generation to that type of
23 site put extra transmission pressure on the land around
24 the site?

25 Where the transmission can go is already

1 geographically limited.

2 DR. MACEDO: A. Certainly if you add
3 more generation in that area, you would need more than
4 transmission than what we have.

5 Q. Okay. Now, would you turn to
6 interrogatory --

7 A. Let me qualify that a bit.

8 Unless of course some of the existing
9 generation is retired in that area. In other words,
10 if, say, Lambton or Nanticoke is retired because it's
11 reached its end of life, and you replace Lambton and
12 Nanticoke, then obviously you don't need to do
13 anything. So my qualification there was, if you add to
14 what we have now you would need this extra
15 transmission.

16 Q. Just let me get that straight, you
17 used an example of withdrawing Lambton and Nanticoke
18 from service, and you are saying that influences the
19 amount of transmission -- that would be just out of
20 Nanticoke and Lambton, wouldn't it?

21 A. I am saying, let's take Lambton, if
22 Lambton was retired and you replaced Lambton with
23 another Lambton station.

24 Q. On the same site?

25 A. On the same site.

1 Q. Oh, yes. Sorry, I was
2 misinterpreting what you are saying.

3 A. Then status quo.

4 Q. Now, would you turn to Interrogatory
5 7.29.66, which is on the last page of the package, page
6 29.

7 THE REGISTRAR: That is .121.

8 ---EXHIBIT NO. 434.121: Interrogatory No. 7.29.66.

9 MRS. MACKESY: Q. My question there was,
10 in Exhibit 52, the transmission aspects of the
11 representatives plans on page 26, Ontario Hydro says:

12 "Plans which require fewer generation
13 stations in general require the least
14 transmission facilities and are best from
15 an environmental perspective."

16 And my question based on that was:

17 "Please explain how Ontario Hydro
18 arrived at these two conclusions: (1),
19 that such plans require the least
20 transmission facilities; and (2), that
21 such plans are best from an environmental
22 perspective."

23 And today I am going to ask you questions
24 on (1), how such plans require the least transmission
25 facilities.

1 The answer to that said, this is the
2 beginning on the fourth line of the response:

3 "The aforementioned statement was made
4 from a conceptual perspective that each
5 new generating station would require a
6 representative quantity of incorporating
7 transmission and the total transmission
8 required by a plan is the sum of these
9 individual components."

10 My question is, might that conceptual
11 approach be inaccurate if a large base load plant is
12 situated in an area of low electricity demand and far
13 from the high demand load centres as opposed to a large
14 base load plant situated in an area of high demand?

15 A. In this conceptual study we looked at
16 just a few sites, and what it's really saying is that
17 in certain plans we didn't need to develop those sites
18 because there was a certain amount of demand management
19 or, let's say -- just leave it at that.

20 So it's saying that the fewer station
21 sites that you needed to develop, the less transmission
22 you would need to build to incorporate that generation,
23 and therefore -- and that's the only statement it's
24 making here.

25 Q. And you weren't thinking of any

1 particular location for those sites when you developed
2 those plans; is that correct?

3 A. Yes, there were sites. Similar to
4 the sites we have, the illustrative sites we have in
5 the Demand/Supply Plan report. But not all the sites
6 were developed.

7 In fact this report here, Exhibit 52,
8 discusses the 15 plans I talked about earlier, and one
9 of those plans was an all-demand management plan, it
10 had no new supply. So, no new supply, no new
11 transmission required to incorporate the new supply.
12 And that's what that first statement really is saying.

13 Q. And would I gather from the way you
14 described the background to this, that the sites which
15 were studied were not all in areas of large demand?

16 A. They weren't all in areas of large
17 demand. A large number of them were in areas of large
18 demand.

19 MRS. MACKESY: I think this might be a
20 good time to take the afternoon break, Mr. Chairman.

21 THE CHAIRMAN: All right. We will take a
22 break for 15 minutes.

23 THE REGISTRAR: The hearing will recess
24 for 15 minutes.

25 ---Recess at 3:27 p.m.

1 ---On resuming at 3:50 p.m.

2 THE REGISTRAR: This hearing is again in
3 session. Please be seated.

4 THE CHAIRMAN: Mrs. Mackesy?

5 MRS. MACKESY: Thank you.

6 Q. I am moving on now to some questions
7 on specific interfaces.

8 First of all though, am I right in taking
9 from the evidence that has been given to this point
10 throughout this panel, that inter-area transmission is
11 governed by power flows across interfaces?

12 DR. MACEDO: A. That is correct.

13 Q. Thank you. Would I be right in
14 taking from that, that a new transmission line from
15 BNPD to the Lake Simcoe area would be an inter-area
16 line because it crosses the FIGTA interface?

17 A. It depends on its purpose.

18 Q. Could you explain that, please?

19 A. Yes. If it is required to
20 incorporate a station, a generating station at Bruce,
21 then it would be radial transmission.

22 Q. Yes. If for some reason some of the
23 units at Bruce weren't working, would that line have an
24 inter-area nature or be able to provide some sort of
25 strength to the system?

1 A. Well, that line is required to get
2 outward out of Bruce, so if Bruce units were not
3 available, then there would be no need for that line.

4 Q. I see. You were mentioning something
5 about runback this morning on the units at Bruce.

6 Could you give me a little more
7 explanation on that?

8 A. Yes. Instead of rejecting units,
9 when you reject units, the units are taken off the
10 system completely. Runback allows you to reduce the
11 power output of the units while maintaining them on the
12 system. And when you do that, the units can continue
13 to provide voltage support to the area. So it has a
14 benefit in that respect.

15 Q. One last question on this specific
16 matter: If a line from Bruce were to run to another
17 direction down to London, would it provide the same
18 sort of inter-area benefit that a line from Bruce to
19 the Lake Simcoe area would?

20 A. No. We are talking about radial
21 transmission earlier, that Bruce to Essa is an
22 alternative to incorporate further units at Bruce.

23 The line from Bruce to London would not
24 be the same need because you need to get from London
25 back to the Greater Toronto area, so you would have to

1 go from Bruce to London to Site A or Milton.

2 Q. So that, as you have described it,
3 Bruce to Lake Simcoe line is a radial line that also
4 provides from inter-area benefit in crossing a
5 particular interface that you want to cross; is that
6 correct?

7 A. Bruce to Essa could provide
8 inter-area capability as well.

9 Q. Yes. This is just a matter of
10 clarification: How is the FIGTA interface different
11 from the FETT interface that was spoken of in earlier
12 panels?

13 A. They are very similar. The main
14 difference is that FETT is east of Milton and east of
15 Trafalgar, whereas FIGTA is west of Milton and west of
16 Trafalgar.

17 Q. Okay. Is that a significant
18 difference?

19 A. Yes. I was going to explain that.
20 It is really to do with the contingency that causes
21 that interface to be limiting. The contingency for
22 FETT was loss of the line between Claireville and
23 Milton.

24 The most significant contingency for
25 FIGTA is the loss of the Bruce to Milton line. And so

1 really, the interface should cross the contingency that
2 causes it to be limiting, and that is why it was moved
3 further west.

4 Q. Thank you. Is power from the Bruce
5 nuclear power development already fed into the northern
6 part of the province over the Bruce to Essa to
7 Orangeville 230 kV lines?

8 A. When you say "northern part of the
9 province", what do you mean by that?

10 Q. North of the Barrie area and up.

11 A. You mean Northern Ontario?

12 Q. Yes.

13 A. Well, in an integrated system, power
14 flows in all different directions. I don't think you
15 could say how much of the power from Bruce goes north.
16 I think what you have to say is, how much of the power
17 from southern Ontario, all the generation in southern
18 Ontario goes north.

19 Q. But that connection between Bruce to
20 Orangeville to Essa is a shorter distance than going
21 around, say, through London to Nanticoke, to Milton and
22 Claireville and back up North?

23 A. Yes. The Bruce to Orangeville to
24 Essa so, that has a 230 kV line and doesn't carry too
25 much power. It is really the 500s that carry the main

1 throughflows.

2 Q. Okay. And now I would like some
3 information, some further information about a couple of
4 sentences on page 5-6 of Exhibit 6, the plan analysis.
5 And this refers to short circuit current levels in the
6 Greater Toronto area.

7 A. Yes, go ahead.

8 Q. Thank you. The sentence I am
9 inquiring about is the last one at the bottom of page
10 5-6, and it reads:

11 Additional transmission around
12 Toronto and increased transmission
13 redundancy will likely be required to
14 ensure adequate security of the Greater
15 Toronto load.

16 And my question is: What does increased
17 transmission redundancy mean in this context?

18 A. I think the scenario being discussed
19 here is the opening of the Finch right-of-way. At the
20 moment, the flow across Toronto from east to west takes
21 place over the 500 kV lines on the Parkway belt
22 right-of-way and the 230 kV lines on the Finch
23 right-of-way.

24 Now, because of the increased load
25 supplied off the Finch right-of-way, we are considering

1 opening those circuits and supplying those loads
2 radially from Cherrywood and Richview. When do you
3 that, you just have one 500 kV corridor across the top
4 of Toronto. If you lose that corridor, you effectively
5 split the system into two, the eastern part and western
6 part.

7 This sentence says that ideally, we need
8 a ring around Toronto. We need to have a separate path
9 of connecting the two parts of the east and west, so
10 that if you lose one half, the other half is there to
11 connect the two.

12 Q. Okay. Now, earlier in the same
13 paragraph - and this is beginning about the seventh
14 line down in that paragraph - the sentence reads:

15 The situation will be seriously
16 aggravated by the addition of a new
17 thermal generating station near the
18 Greater Toronto area.

19 First of all, what do you mean by the
20 phrase "near the Greater Toronto area"?

21 A. That is just referring to Darlington/
22 Wesleyville, as far east as that.

23 Q. I see.

24 A. In fact, that sentence applies to
25 non-utility generation as well located in the Greater

1 Toronto area. Any generation in that area will affect
2 the short circuit levels.

3 Q. Would building more transmission just
4 within Toronto and the Greater Toronto area overcome
5 some of those problems?

6 A. Yes. See, the whole system in
7 Greater Toronto area is very tightly interconnected
8 and with the generation, produces these high
9 short-circuit levels.

10 What we would do is to disentangle the
11 transmission lines in the Greater Toronto area. And by
12 disentangling them rather than connecting them all
13 tightly, you reduce the short circuit levels.

14 But once you disentangle them, then you
15 reduce the security and so you need this extra
16 transmission to allow you to maintain the same level of
17 system security.

18 Q. Okay. Is there any technical reason
19 against building transmission in Toronto?

20 A. No. That is what we would do; we
21 would build transmission to make up for the
22 disentangling of the transmission system.

23 Q. Now, this goes back again to the
24 Coalition of Environmental Groups' cross-examination in
25 Volume 102, and I think you said there that you haven't

1 yet done an analysis of the impact of the plan update
2 on the inter-area transmission plans but that you would
3 be doing so within the next few months; is that
4 correct? It is at page 17918.

5 A. I think I know that section, yes. We
6 have all these plans, as I said, and what we do is keep
7 reviewing these plans in the light of the update. The
8 timing of some of these plans would change. Maybe the
9 sequencing of some of these plans would change. And we
10 would have to review these to determine the most
11 appropriate timing and sequencing. And certainly we
12 have to go through the business planning process in the
13 next two months and so we would be doing that, yes.

14 Q. Would the results of that analysis be
15 made available to the public?

16 A. I don't think we were planning to
17 make it public, but there will be a list of plans with
18 in-service dates and the cost associated with each of
19 these plans.

20 Q. I see. Well, my next question has to
21 do again with Exhibit 6, the plan analysis, and this
22 time it is figure 5.1 on page 5-3.

23 A. Okay.

24 Q. And when going through this list of
25 pre-2,000 transmission line additions, with the CEG,

1 you used the word "committed" to describe several of
2 them.

3 Does committed the way you used it mean
4 in-service?

5 A. No. I should have been more precise.
6 If you like I can go through that list and tell you
7 which ones of those are in-service.

8 Q. I would like that if you could,
9 please.

10 A. Bruce to Longwood is in-service;
11 Cherrywood to Bowmanville is in service; Nanticoke to
12 Longwood is in-service, and that is it.

13 Q. Thank you.

14 A. I might add though the dates. The
15 in-service dates of the committed plans are not
16 quite -- they are not the same as these dates.

17 Q. Okay. Have you given that earlier in
18 evidence somewhere?

19 A. No. I could tell you now if it
20 helpful to you.

21 Q. All right, yes. Thank you.

22 A. Milton to Nanticoke is '94.

23 Q. Yes?

24 A. Lennox to Hawthorne stays as '92.

25 Q. Yes?

1 A. Claireville to Cherrywood stays at
2 '93.

3 Q. Yes?

4 A. Lennox to Bowmanville stays at '94.
5 Milton to Middleport, that is '98. I think the rest
6 can stay as they are.

7 Q. Okay. Now, my next question deals
8 with something I was told at a DSP information centre
9 in early 1990. I was told that on the basis of
10 geographically balancing load and generation, the first
11 major supply station could be built east of Toronto,
12 but if that were done, the second station should be
13 built west of Toronto.

14 If you were considering major supply
15 stations, would that analysis still be accurate?

16 A. In the plan analysis, we had two
17 siting options, if you wish: It had Darlington
18 followed by North Channel; and the second option had
19 that order reversed. It had North Channel first,
20 Darlington second.

21 The third station could either be --
22 again, in this Chapter 5 of plan analysis, it shows the
23 sequencing of these stations and --

24 Q. I don't think I have to go into that
25 detail.

1 A. No.

2 Q. What I was really getting at was a
3 more general idea.

4 Would you agree that if you have
5 identified very few sites to begin with, once you start
6 applying system design criteria of that sort, that you
7 will rapidly eliminate some of the few sites you have
8 and you may be left with only one that really fits?

9 A. These sites were purely illustrative.
10 As part of the siting process for the next station, a
11 whole range of sites will be considered. They won't be
12 limited to just these sites.

13 [4:05 p.m.]

14 Q. And I have one more electrical system
15 question before moving on to a different topic. This
16 is about the estimate of line losses associated with
17 the banking of nuclear energy which has been suggested
18 is a benefit of the Manitoba Purchase. In Exhibit
19 434.3, which is the evaluation of the 1,000 megawatt
20 purchase from Manitoba Hydro, that's page 7 of that.

21 A. Yes, go ahead.

22 Q. I believe near the bottom of the page
23 there is a figure of 15 per cent given as the line
24 losses; is that correct?

25 MR. HUGGINS: A. Yes, that's correct.

1 Q. And I wonder between which points
2 that was calculated, or was it done in a different way?

3 DR. MACEDO: A. Perhaps I will answer
4 that.

5 The way we do these losses is that we
6 simulate the power transfers without the purchase,
7 determine the losses, this is total system losses, and
8 then repeat the study with the purchase and the
9 associated transmission, calculate the losses, compare
10 the two.

11 Q. So, what you use then is the present
12 system with and without -- the present system as it is
13 now and then the present system with the Manitoba
14 Purchase, is that how it's done?

15 A. No, it would be the system we would
16 build without the purchase, and you recall we had all
17 the lines in the North, so those lines are assumed to
18 be in place without the purchase.

19 Obviously, we would also replace the
20 1,000 megawatts of Manitoba with something else. But
21 it's essentially comparing the two, the case with the
22 purchase and without the purchase, and it shows a 15
23 per cent difference.

24 Q. When you say you replace the 1,000
25 megawatts from Manitoba with something else, what else

1 would you replace it with?

2 A. Let me answer that question you pose
3 and Mr. Huggins wants to say something.

4 Q. Yes.

5 A. I can't remember what was used to
6 replace Manitoba. It could have been one of the other
7 supply options advanced, it could have been more
8 non-utility generation, I don't know. But whatever it
9 was would have been in the south, not in the North.

10 Q. Okay. Mr. Huggins, did you to add
11 something?

12 A. I'm sorry, I realize Dr. Macedo was
13 answering the question you asked.

14 Q. Thank you.

15 Now, Mr. Bancroft-Wilson and Dr.
16 Tennyson, I think the next questions are for you
17 people, and these are general questions about the
18 environmental assessment of transmission areas.

19 I am not sure whether this is the sort of
20 question I may ask but I will try it and we will see
21 what comes of it.

22 Can anyone on the panel confirm that it
23 was staff in the system planning division that drew the
24 shaded radial transmissions areas on the notice map?

25 MRS. FORMUSA: I am going to object to

1 that question for the reasons that the Chairman gave at
2 the outset of the panel after arguing of the motion.

3 MRS. MACKESY: Q. What does Ontario
4 Hydro mean when speaking of the rationale for radial
5 transmission?

6 DR. MACEDO: A. I would say need for the
7 radial transmission.

8 Q. What do they mean then when speaking
9 of requirement?

10 MR. BANCROFT-WILSON: A. I think if you
11 put the two together, the requirement is the need for
12 it and the rationale are the reasons for that, what are
13 the reasons behind that requirement or that need.

14 Q. At the DSP level with regard to
15 radial transmission, is the requirement/rationale based
16 mostly on financial cost estimates and technical
17 considerations?

18 DR. MACEDO: A. You are saying in
19 Exhibit 6?

20 Q. Yes.

21 A. Well, they were just illustrative
22 again. We said for a large station you need two double
23 circuit lines to connect the station to the nearest
24 switch yard, and then we costed that out using unit
25 costs. It was no more than that.

1 MR. BANCROFT-WILSON: A. Certainly from
2 an environmental perspective it was just to
3 characterize the types of effects that could be
4 associated with that radial transmission, and again
5 through the use of the right-of-way area an attempt to
6 quantify the relative amounts of transmission required
7 between the options.

8 Q. To arrive at some sort of cost?

9 A. Well, no, the area was used as a
10 basis for indicating that the amount of right-of-way
11 that would be required is an indicator of potential --
12 for environmental effects.

13 Q. I see. So then you came up with a an
14 acreage or length for the right-of-way and worked out
15 from that what you thought the environmental effects
16 would be, the amount of environmental effects?

17 A. Again, Dr. Macedo can correct me
18 here, but I believe that looking at the options, and
19 the generation was included in the options, the amount
20 of bulk transmission that would be needed to
21 incorporate -- that radial transmission required that
22 was looked at and then a calculation of the amount of
23 right-of-way that would be involved to accommodate that
24 transmission, and that's the basis for arriving at the
25 area of transmission right-of-way required for each

1 plan.

2 DR. MACEDO: A. In the plan analysis we
3 have the approximate distances, lengths of
4 transmission.

5 Q. Yes.

6 Now, Mr. Bancroft-Wilson, is it correct
7 that no assessment of a natural environmental was done
8 for the radial transmission associated with those
9 illustrative sites?

10 MR. BANCROFT-WILSON: A. No, that's
11 correct. In our direct evidence we indicated that the
12 actual effects of the transmission line will depend
13 very much on the site-specific location that those are
14 in. So we tried to give an overall characterization of
15 the types of effects that may be encountered and the
16 likelihood that they could be mitigated or offset or
17 managed, but there was no site-specific assessment or
18 any attempt to try to locate those lines to give you a
19 basis for trying to do a detailed assessment.

20 Q. And, Dr. Tennyson, is that also
21 correct that no assessment of the social environment
22 was done for the radial transmission associated with
23 the generation?

24 DR. TENNYSON: A. That's my
25 understanding.

1 Q. Nothing has been done since 1989 when
2 the DSP report was published for either the natural or
3 the social environment?

4 MR. BANCROFT-WILSON: A. There has been
5 no further information prepared to put into the plan
6 beyond our direct evidence.

7 Q. Okay. Ontario Hydro's lawyer may
8 object to this question, but I am going to place it and
9 see what happens.

10 Can anyone on the panel confirm that
11 Bruce C is shown in the wrong location on the notice
12 map?

13 MRS. FORMUSA: I object.

14 MRS. MACKESY: Q. Dr. Macedo, you
15 mentioned having over a thousand bulk transmission and
16 regional supply plans. Are these held in reserve
17 against the time when you might need one or more of
18 them? I gather that is so because you say you
19 constantly update them.

20 DR. MACEDO: A. I haven't counted the
21 plans. I just gave a rough estimate to show you the
22 magnitude of the problem of including all those plans
23 in this hearing.

24 Q. No, I wasn't suggesting that.

25 A. No. I wouldn't say they are kept in

1 reserve. I would say that we have these plans -- they
2 have different probabilities of materializing over
3 time. For instance, the plans in the next few years,
4 plans that are going to be in-service in the next three
5 or four years we are working on very actively. The
6 plans that are going to be in-service beyond the year
7 2000, some of them are very, very tentative and there
8 may be duplicates as well because we sometimes put in
9 alternatives that serve the same purpose, we just put
10 them in so that they come up for review every so often.
11 And as we get nearer to the date and so on, we then
12 eliminate some of those duplications.

13 Q. Mr. Bancroft-Wilson, do you hold
14 previous environmental assessments in reserve?

15 MR. BANCROFT-WILSON: A. We do initiate
16 environmental assessment projects based on a
17 requirement or a need at the time, and often those
18 studies, because of changes in the forecast or
19 requirements in an area, are stopped in mid process, so
20 prior to us completing them or filing them, and then at
21 times we would then, say, a few years down the road
22 pick them up and initiate them again.

23 As well we have environmental assessments
24 that have been submitted for approvals, approvals which
25 we have obtained which we will -- the actual

1 construction of the facilities will be deferred again
2 because the need is not there at the time.

3 Q. Okay. My next group of questions is
4 on the farm environment and they are most likely
5 appropriate to you Mr. Bancroft-Wilson.

6 In your direct evidence you said that in
7 southern Ontario agriculture is the predominant land
8 use and activity on the landscape.

9 Would you please turn to interrogatory
10 7.29.17, on page 3 of the package.

11 THE REGISTRAR: 7.29.17 is .122.

12 MRS. MACKESY: Thank you.

13 ---EXHIBIT NO. 434.122: Interrogatory No. 7.29.17.

14 MRS. MACKESY: Q. In that interrogatory
15 I asked:

16 Does a considerable amount of Ontario
17 Hydro transmission in Ontario Hydro's
18 western, Georgian Bay, central and
19 eastern regions directly affects farms?
20 Within my meaning of farm I am including
21 the total property area, including
22 woodlots, fence lines, waterways,
23 buildings, et cetera, as well as the farm
24 land.

25 And the reply was yes.

1 My question is: Would you say that in
2 southern Ontario the bulk transmission rights-of-way
3 predominantly affect the farm environment, as I have
4 described it, in this interrogatory?

5 MR. BANCROFT-WILSON: A. In southwestern
6 Ontario?

7 Q. You can start with southwestern
8 Ontario.

9 A. Yes, a predominant amount in
10 southwestern Ontario do.

11 Q. That's the area west of the line from
12 Georgian Bay through Barrie down to Lake Ontario?

13 A. I refuse to answer on the grounds
14 that I would not want to place this hearing in any
15 jeopardy. [Laughter]

16 It's called Guelph, Perth County, Bruce
17 County, Grey County.

18 Q. The reason I ask is that when I use
19 the term "southwestern Ontario" I am using thinking of
20 Kent, Essex and Lambton, maybe Elgin and Middlesex
21 thrown in, but not so much as the other area.

22 A. I think Middlesex would fall into
23 that as well, and parts of Grey County probably.

24 Q. Would it be true for eastern Ontario?

25 A. I must admit, my knowledge of eastern

1 Ontario is more limited and there are certainly farm
2 properties there, but they are many properties, or
3 perhaps rural properties but may not be classified as
4 "farm" properties.

5 Q. Would you please turn to
6 interrogatory 7.29.35, at page 17 of the package,
7 please. Page 17 and the number is 7.29.35.

8 THE REGISTRAR: That is .123.

9 MRS. MACKESY: Thank you.

10 ---EXHIBIT NO. 434.123: Interrogatory No. 7.29.35.

11 MRS. MACKESY: Q. My question there is:

12 What is meant by the term agricultural
13 lifestyles? This was used in the May
14 1990 Ontario Hydro bulk transmission west
15 of London environmental assessment.

16 The answer was:

17 Agricultural lifestyles was a general
18 term used to characterize the predominant
19 way of life throughout the study area.

20 It is mainly a rural agricultural area
21 with farming, agricultural industries and
22 services fundamental to many people's
23 lives.

24 My question is: Is that term with that
25 meaning generally applicable to rural agricultural

1 areas elsewhere in southern Ontario?

2 DR. TENNYSON: A. In this particular
3 study that was the area of southwestern Ontario that
4 was predominantly Lambton, Essex, Kent, Middlesex.

5 What other...

6 Q. If you were using the term
7 agricultural lifestyles for other farm areas, would you
8 use that same definition?

9 A. Presumably in a study if one were to
10 identify that the area had a large number of
11 agricultural lifestyles meant in that way, yes.

12 Q. Now, Mr. Bancroft-Wilson, in your
13 direct evidence on January 8th, I think you said that
14 as a specific example of lifestyle, or you use as a
15 specific example of lifestyle the Flying Farmers of
16 Southwestern Ontario. Now, I am not familiar with that
17 term, could you explain what that means, please?

18 MR. BANCROFT-WILSON: A. Perhaps Dr.
19 Tennyson used that term.

20 Q. Sorry. Okay.

21 DR. TENNYSON: A. When we were
22 conducting that study a number of the farmers
23 throughout that area have their own planes and
24 airstrips on their property. And so in terms of
25 identifying routes and in terms of evaluating routes

1 this became an important consideration. Obviously
2 depending on where the route would be it might affect
3 flight paths and disrupt that sort of activity.

4 In fact, it was very much a way of life
5 for these people. One particular farmer could take
6 care of his business in that area in the morning, fly
7 up to North Bay and visit his mother and then fly back
8 in time for the evening activities. Others used it for
9 businesses. One chap, he did additions to houses and
10 stuff throughout the area so he was able to fly
11 throughout southwestern Ontario.

12 So that's what I meant by the Flying
13 Farmers. They had the association that was quite
14 active in our studies as well.

15 Q. So, these planes were not used in a
16 purely agricultural way then?

17 A. No.

18 Q. Okay. Now, in the course of the
19 contact with farmers have you found -- first of all, I
20 wasn't familiar with this situation, that is not
21 general throughout the farming areas of Ontario?

22 A. I don't honestly know.

23 As I say, for me when we start our
24 studies go and try and discover everything about the
25 area, and clearly in that part of Ontario this is quite

1 a predominant part of their lifestyle.

2 Q. Mr. Bancroft-Wilson, could you
3 comment on that?

4 MR. BANCROFT-WILSON: A. Certainly we
5 have encountered other people that have their own
6 planes throughout. But it's not a predominant
7 activity, no. But you do find them interspersed
8 throughout most counties.

9 Q. Okay. I am not quite sure which of
10 you to address this question to, so I will just place
11 it.

12 In the course of your contact with
13 farmers have you found perhaps a more widespread
14 agricultural outlook which could be described as a
15 close attachment to the land and a dislike of having
16 part of the farm property interfered with by outside
17 forces such as Ontario Hydro?

18 A. Certainly a great attachment to the
19 land. Farmers, stewardship of the land is what they
20 take great pride in. So anything that will hinder that
21 or take away some of that pride of their land or
22 stewardship of the land is a concern to them.

23 I might add that same type of principle
24 will go for people who have rural properties, or
25 properties, be they farmers or not. But certainly

1 there is a great attachment in respect to the land from
2 most farmers we have dealt with.

3 Q. To carry on from that, I think I want
4 to refer to some of the evidence you gave under -- I am
5 not sure whether this is cross-examination or direct
6 evidence. You were speaking of vegetation control.
7 It's in Volume 97 at page 17051, and it's your direct
8 evidence.

9 [4:26 p.m.]

10 It is page 17051, beginning at line 18.
11 And I will just read the few lines in which I am
12 interested:

13 "Vegetation control would not be
14 necessary in areas where the line is
15 used, in areas through agricultural areas
16 where the right-of-way is in agricultural
17 use or other areas where secondary uses
18 occupy the right-of-way."

19 Now, before going on to the agricultural
20 context, what do you mean by the last part of the
21 sentence, "or in other areas where secondary uses
22 occupy the right-of-way"?

23 A. For example, if you were going
24 through an area that was used for a recreational area
25 so the right-of-way was maintained as part of that

1 overall activity, areas where the line would be used
2 for storage, parking, things where the presence of the
3 other activity takes care of looking after the
4 condition of the right-of-way.

5 Q. And what did you mean by the first
6 part of the statement, "vegetation control would not be
7 necessary in areas where the line is used through
8 agricultural areas"?

9 A. If the line is used for ongoing
10 agricultural activities, cultivation practices, then
11 again, the unwanted incompatible vegetation is not
12 going to occur in the line. It is going to be farmed
13 as part of the rest of the farm. And perhaps with the
14 exception of the tower bases, there is not going to be
15 any need to control unwanted vegetation.

16 Q. Okay. I have got some specific
17 questions to address to that: Supposing a right-of-way
18 goes through a farmer's field but he happens to have a
19 tree that he has maintained there for years, not cut
20 down because he likes the shade from it or just the
21 appearance of it, that tree would have to come down on
22 a right-of-way, wouldn't it, if it were tall?

23 A. Yes, yes, it would. I am referring
24 here in my evidence to after the right-of-way has been
25 established. This is the right-of-way management

1 activity, so the ongoing activities.

2 But clearly, vegetation would have to be
3 removed in the initial stage of right-of-way clearing,
4 be it on farm properties or wherever.

5 Q. What I am addressing then is the
6 initial stage, the construction stage rather than the
7 follow-up stage.

8 Carrying on. If a right-of-way is placed
9 on a field boundary or lot line where trees are
10 growing, these trees would have to be cut down?

11 A. Yes, depending on the type of
12 vegetation there. If it is low growing shrub-type
13 vegetation, hawthorn, things like that, it is possible
14 that type of vegetation can be left. But if they are
15 mature trees, you know, in excess of 15, 20 feet in
16 height, then they would have to be removed.

17 Obviously in areas where that is a
18 problem, we do get into replacing those with compatible
19 vegetation. So on recent projects in some cases where
20 there is concern about wind erosion, if we had to
21 remove that type of vegetation, that windbreak, we
22 would replant with spruce or something that would be a
23 slower lower growing species which would still replace
24 the windbreak. When I say spruce, spruce or, I guess,
25 cedar would be another example we would use.

1 Q. Okay. However, what was there before
2 would no longer be there if --

3 A. That's right. If it was judged to
4 be incompatible with a safe operation of the line.

5 Q. And this would apply in wood lots as
6 well; would that be correct?

7 A. That is correct again. Selective
8 cutting can occur, but anything that is going to pose a
9 danger to the line or will be of sufficient height to
10 contact the line would be cleared within the
11 right-of-way area.

12 Q. And if a right-of-way was placed
13 through a creek or swamp area where a farmer had been
14 planting a variety of trees on uncultivated corners of
15 land, those trees would have come down too.

16 A. Yes, if they were incompatible and
17 based on the characteristics. In lower areas, perhaps
18 if your tower is higher up, you can leave more
19 vegetation. So, in swamp areas, you might be able to
20 leave the lower growing species, but anything that is
21 going to grow tall would have to be removed.

22 Q. And a farmer might look upon this as
23 a form of damage and that would be permanent for the
24 life of the line?

25 A. The removal of that vegetation, yes,

1 would be permanent, subject, of course, to our
2 reforestation policy which will offer to reforest on
3 that person's land an equivalent area to the forested
4 area removed.

5 Q. A farmer might have intended to do
6 that himself sometime later on, so there might not be
7 any net --

8 A. That is true and that is why the
9 policy - if the farmer doesn't want it, then it is
10 offered to the township, to the conservation authority.
11 I mean, the idea is to try to keep the same, hopefully
12 the same amount of vegetation in the municipality in
13 the general area, but if the farmer doesn't want it,
14 that is a possibility.

15 Q. But his individual environment is
16 affected even though you might have made some sort of
17 compensation within the municipality?

18 A. Yes. On that specific property, the
19 vegetation would be lost permanently.

20 Q. Moving on. When Ontario Hydro builds
21 a tower in a field or on a fence line or a lot line,
22 would you agree that the tower is an impediment to the
23 present and possibly future agricultural operations?

24 A. Yes, it is an impediment to differing
25 degrees. You mentioned on a fence line. Fence lines

1 again have been indicated by a majority of farmers,
2 that if we have to go through an area, then on the edge
3 of the field or on the fence lines are the best
4 locations, out of the cultivated portion of the field.

5 But even on a fence line that is very
6 narrow, parts of the tower could still protrude into
7 the cultivated portion and any obstruction in the
8 cultivated portion of a highly mechanized farm is an
9 impediment.

10 Q. That type of impediment or damage is
11 permanent for the life of the tower line?

12 A. Yes it is, and that is part of the
13 compensation package on agricultural land, is there is
14 a payment for -- in addition to the right-of-way, there
15 is a payment for the number of towers located on a
16 farm. Each tower is compensated for based on the value
17 of the land to offset some of that disruption and the
18 long-term presence.

19 Q. Okay. But in spite of the payments,
20 it is still there, supposing the farm can be sold and
21 the original owner could have gone off with the
22 payment.

23 A. Yes.

24 Q. Okay. Are rights-of-way in a farm
25 environment generally placed along fence lines and lot

1 lines?

2 A. That is what we try to do. In the
3 studies I have been involved in the last ten years, it
4 is one of the things the farm community has indicated
5 to us, is a way to minimize the impacts.

6 But there are many lines, older lines,
7 that have been built over the years where there hasn't
8 been any attempt to really locate the right-of-way
9 adjacent to the farm boundaries.

10 Q. And moving on to a different type of,
11 let me call, damage.

12 Are there other general forms of residual
13 permanent damage to the farm environment such as the
14 visual damage from having a tower line?

15 A. Certainly, if you put 150, 170-foot
16 transmission line through an area, it is going to
17 change the appearance of that area and the extent of
18 how much impact that causes will depend on the
19 circumstances, the perception of the owner, subsequent
20 owners.

21 Often subsequent owners will come along
22 and it is part of the landscape, but often to the
23 original owners, the people that have been there,
24 especially if they have been there a long time, that is
25 a substantive change to the landscape.

1 Q. Okay. Now, these would be examples
2 then of damage that it is really impossible to avoid?

3 A. Certainly, visual impact, as I said
4 in my direct, is difficult to mitigate once the
5 facility is there, the removal of vegetation.

6 Again, through routing, you can attempt
7 to minimize these things, but ultimately, those things
8 we just talked about are examples of effects that will
9 occur, impacts that will occur as a result of placing
10 the facilities in some location.

11 Q. Towers on farmland could interfere
12 with the present developments as well as later types
13 of --

14 A. By developments, you mean buildings?

15 Q. No. I mean agricultural practices
16 like working the land.

17 A. Yes. There is some impact on
18 agricultural operation. Economically, we try to
19 compensate for that, but there are ongoing things that
20 the farmer has to deal with on that piece of property.

21 Q. Okay. Now, taking into account this
22 permanent damage, when transmission lines are placed in
23 farm environments, do you find it strange that
24 particular farmers may not want to accept transmission
25 lines? Do you find it strange there are sometimes

1 recurrent farm opposition to transmission lines?

2 A. No. That is to be expected and the
3 opposition will vary greatly amongst the farm
4 communities. Some people will, you know, be very
5 opposed and other peoples -- you can conduct a study
6 for a couple of years in an area and have meetings,
7 community meetings, and various opportunities and some
8 people don't get involved too much at all. It will
9 vary from person to person.

10 Q. Do you ever hear the statement, "we
11 don't like it, but we don't feel we can do anything
12 about it"?

13 A. Yes, I have heard that. We tell
14 people that is not true. You can do something about
15 it. You can get involved in the studies, get involved
16 in your community groups, organizations, get involved
17 in the hearings.

18 So, we hear that a lot and we tell people
19 that -- they just say, you are coming through no matter
20 what we do and we say that is not so and you should get
21 involved and have your say.

22 Q. Okay. Would you please turn to
23 Interrogatory Response 7.29.54 at page 22, please?

24 THE REGISTRAR: That is .124.

25 MRS. MACKESY: .124, thank you.

1 ---EXHIBIT NO. 434.124: Interrogatory No. 7.29.54.

2 MRS. MACKESY: Q. In this question I
3 ask:

4 "What is the life expectancy of a
5 transmission right-of-way, i.e. does it
6 ever revert to the landowner or his/her
7 heirs or successors?"

8 And the reply was:

9 "As long as the facilities on the
10 right-of-way are needed and their
11 refurbishment can be justified, there is
12 no limit to the life expectancy of a
13 transmission right-of-way. In other
14 cases the right-of-way is either reserved
15 for future system developments or
16 relinquished."

17 And I just have brief questions from that
18 reply.

19 Would I be right in thinking that with
20 measures such as rebuilding, a tower line could last
21 50, 100 or 150 years or longer?

22 DR. MACEDO: A. Yes.

23 Q. And the right-of-way would similarly
24 last indefinitely?

25 A. Yes.

1 Q. Now, my next questions have to do
2 with the use of narrow-based towers.

3 Would these be for you, Mr.
4 Bancroft-Wilson.

5 MR. BANCROFT-WILSON: A. Yes, I believe
6 so.

7 Q. Okay. And for this section of my
8 cross-examination, I want to use pages 6 through 14 of
9 the interrogatory package. And perhaps exhibit numbers
10 could be assigned to those interrogatories in advance.
11 So, I would start with 7.29.22 on page 6.

12 THE REGISTRAR: 7.29.22 is .125.

13 MRS. MACKESY: .125.

14 ---EXHIBIT NO. 434:125: Interrogatory No. 7.29.22.

15 MRS. MACKESY: Going on to 7.29.24 on
16 page 7.

17 THE REGISTRAR: 7.29.24 is .126.

18 MRS. MACKESY: .126.

19 ---EXHIBIT NO. 434.126: Interrogatory No. 7.29.24.

20 MRS. MACKESY: And next, 7.29.25 on page
21 8?

22 THE REGISTRAR: That is .127.

23 MRS. MACKESY: .127.

24 ---EXHIBIT NO. 434.127: Interrogatory No. 7.29.25.

25 MRS. MACKESY: Going on to 7.29.23 on

1 page 9?

2 THE REGISTRAR: 7.29.23 is .128.

3 ---EXHIBIT NO. 434.128: Interrogatory No. 7.29.23.

4 MRS. MACKESY: And finally, 7.29.29 on
5 pages 10 through 14?

6 THE REGISTRAR: That is .129.

7 MRS. MACKESY: .129. Thank you.

8 ---EXHIBIT NO. 434.129: Interrogatory No. 7.29.29.

9 MRS. MACKESY: And in this part of my
10 cross-examination, I would also be using Exhibit
11 434.74, and that was Interrogatory Response 7.10.182.
12 That isn't in the interrogatory package - Exhibit
13 434.74.

14 Q. Now, first of all, I want to get one
15 side issue out of way. Is my memory correct, Mr.
16 Bancroft-Wilson, that Ontario Hydro uses steel pole
17 towers in urban areas to reduce the impact of
18 transmission lines in those areas?

19 MR. BANCROFT-WILSON: A. Ontario Hydro
20 has used steel poles, but it is not a given. In
21 certain applications we have used them.

22 Q. Well, then turning to Interrogatory
23 7.29.29 in my package and going to page 14 of that
24 package, this would be Exhibit 434.129.

25 Is the tower illustrated in figure 11.6

1 an illustration of the steel pole towers that have been
2 used in urban areas?

3 A. Yes, it is.

4 Q. Okay. Could you give me a cost
5 comparison between a 230 kilovolt double circuit
6 narrow-base tower and a 230 kV double circuit steel
7 pole tower? Do you have that sort of information
8 available?

9 A. I will just have to see if it is on
10 the information I have with me. Just give me a second.

11 Q. Okay.

12 A. The table of unit costs I have here,
13 I don't have a steel pole tower.

14 Q. Would it be possible for you to find
15 that overnight and come back with it?

16 A. I will do my best.

17 Q. Okay. Thank you.

18 Now, to concentrate on the narrow-base
19 towers, what advantages and disadvantages does Ontario
20 Hydro see regarding the use of these towers which I
21 gather are for use in agricultural situations?

22 A. Well, the towers were designed in the
23 1980s as a result of a lot of work and studies with
24 the farm community to -- actually, they arose out of a
25 concern actually in the 70s over the dwindling

1 agricultural resource base. And there was a concern
2 that land taken up by the tower base was obviously lost
3 from permanent production, unlike the rest of the way
4 of right-of-way which was still in production. And
5 there was also an area of influence around the tower
6 base where production inefficiencies occurred.

7 So they really started from that basis
8 and they were designed to essentially shrink the tower
9 base. Rather than having, you know, a 30 to 35,
10 40-foot tower base on four separate feet, we got it
11 down to a base of about 13, 14 feet square. That was
12 over a period of time. It was worked out, again,
13 working the provincial agricultural bodies, primarily
14 with the OFA, the Ontario Federation of Agriculture,
15 and people in the route and site selection group and
16 the design group.

17 It became a concept at that point along
18 with sort of agreeing to criteria to route transmission
19 lines; a transmission line should ideally follow farm
20 boundaries, fence lines, be located with the
21 non-productive portions of farms.

22 They were designed and installed on the
23 Bruce to Longwood line in the late 80s and also used on
24 the Longwood to Nanticoke line which was recently put
25 in-service.

1 They are used in straight line locations,
2 suspension locations; in other words, they can't be
3 used where the line turns at angle towers, but they are
4 used in the straight portions between angles.

5 They are used in suspension locations
6 where the line of the tower would be located in a
7 productive portion, in a cultivated portion of
8 productive agricultural land.

9 The criteria classes 1 to 4 were used
10 originally, CLI classes 1 to 4 as well as specialty
11 crop lands; so, in other words, the better agricultural
12 land.

13 Actually, we also use them even when we
14 are on a field boundary on a fence line if it is a
15 fairly narrow area and the tower would protrude out in
16 the cultivated portion. We have also installed them in
17 those areas.

18 They are not installed through areas that
19 would be permanent pasture, rock-filled with trees in
20 them, so areas that are permanently in pasture, we
21 would not put them in or areas such as through woodlots
22 where there is a farm woodlot and we are going through
23 the farm woodlot.

24 [4:45 p.m.]

25 They are essentially for areas that are

1 in cultivation at the time we plan and build the line.

2 The benefits have been again -- the loss
3 of land areas, it's relatively small. You may be
4 saving 2- to 3,000 square feet of land, but I think
5 probably the biggest benefit that has subsequently come
6 out in talking to the farm community is, it's just less
7 of an obstruction to go around.

8 Also it's concrete. The 14 by 14 foot
9 cap is permanent concrete so you don't get any weed
10 infestation, so that's an advantage. The farmers don't
11 have a problem with the weeds growing up inside the
12 towers and infesting the area around.

13 Anyway, I think they have been relatively
14 well accepted and I think we are, in part, responsible
15 for obtaining the approvals on the Bruce to Longwood
16 lines and the London to Nanticoke lines, and the farm
17 community felt Ontario Hydro had listened to them, and
18 that, together with the actual routing of the line, the
19 siting of line, which took into account many of their
20 concerns, they have been very helpful in forging better
21 relationships with the farming community and showing
22 Ontario Hydro is interested about trying to minimize
23 its impacts.

24 Q. That is what I was going to ask you
25 next.

1 Do you think that farmers look upon this
2 as an attempt of Hydro to take an extra step to
3 minimize the impact since so much transmission goes
4 through?

5 A. Yes, I believe that and I have heard
6 many others -- farmers and Ontario Hydro people who
7 have found the same.

8 Q. And the reverse of that is that if
9 you don't put them they feel you are backing away from
10 them?

11 A. We are coming to that now, yes,
12 Yes, that's right, they can't be used
13 everywhere, but I will let you ask the question.

14 Q. I am not sure whether this is the
15 question you think I was going to ask.

16 Actually, I am going to delay on that
17 question and go back to one comment you made about
18 woodlots. You said you don't use them in woodlots. I
19 am just going to outline something which I think I
20 remember from an earlier hearing, and that was, if a
21 transmission right-of-way is cut through a woodlot or
22 along the edge of the woodlot in a farm situation, does
23 Ontario Hydro do something called grubbing out the land
24 in order to take out the stumps?

25 A. If it's a natural extension of an

1 existing field, an extension of an existing cultivated
2 field, the farmer requests it, we can get the necessary
3 agreement from the Conservation Authority and the
4 Ministry of Natural Resources, people like that, and
5 yes, we do conduct grubbing which is physically
6 removing the stumps and plowing it and removing the
7 rocks and putting it into a state where it is suitable
8 for cultivation.

9 Q. So then certainly from a farmer's
10 point of view this would be part of his cultivated
11 land. In those situations he might request a
12 narrow-based tower for that area; right?

13 A. Yes, some people have done that. I
14 am not sure of all the situations but I know of one
15 situation where -- and that's why I qualified the
16 locations we are prepared to locate them is in areas
17 that are presently under cultivation.

18 Where we have grubbed an area we are not
19 prepared to put in a narrow-based tower, because
20 whether that land is grubbed or not will depend -- and
21 often happens after the construction is completed or
22 some point during that time the farmer decides on. So
23 our approach is that where we have located it in a
24 woodlot, even though the area may be grubbed, we will
25 put in a standard-based tower.

1 Q. This could be a matter of
2 disagreement between...

3 A. It has been in some cases, yes.

4 Q. Now, moving on to Interrogatory
5 7.29.22, this is Exhibit 433.125.

6 A. What page number is that?

7 Q. That's on page 6, sorry.

8 In the second part of that question, I
9 asked Ontario Hydro to confirm whether it is possible
10 for Ontario Hydro to build these narrow-based towers
11 anywhere in spite of soil conditions, which have been
12 listed as a limiting factor.

13 And the response came back:

14 It is possible, however, costs
15 technical and environmental
16 considerations may arise if certain soil
17 conditions are found.

18 I was wondering, Mr. Bancroft-Wilson, if
19 you could elaborate on what is meant by environmental
20 considerations in that reply?

21 A. I'm not sure. I am just trying to
22 think of a situation.

23 An environmental situation may be -- I
24 was going to say in a wetland but that wouldn't be
25 productive agricultural land. I can't think of...

1 Primarily it's been technical reasons in
2 the projects that I have been involved in. I can't
3 think of too many "environmental" considerations why we
4 wouldn't be able to put a narrow-based tower in.

5 Q. Could you describe some of the
6 technical considerations?

7 A. Yes. The technical considerations
8 that we encountered on the Bruce to Longwood line were
9 that in putting the foundation for the tower in, it
10 requires to auger, drill a hole, 30, in some cases up
11 to 40 feet deep, and at least 8 feet or perhaps greater
12 in diameter, and in unstable soil conditions, the
13 structure the soil is such that the hole will cave in
14 as you are augering that hole.

15 So, there were situations where we
16 encountered soil conditions that were essentially sand
17 and gravel with a lot of water in it, geotechnically
18 they called it high moisture content non-cohesive
19 soils, that meant they mushed when they got into them,
20 and they were layers that came at certain depths, and
21 as a result you couldn't auger the hole and put the
22 concrete in the normal manner. Various attempts were
23 made to try to overcome this problem and it was
24 determined that it really was going to take a
25 considerable extra cost to construct towers in those

1 conditions. So that became a limiting factor.

2 Based on the soil tests that are done for
3 each tower site, it's looked at as far as what exactly
4 the soil conditions are there and a decision is made
5 whether it's technically feasible, technically and
6 economically feasible to put a narrow-based tower in.

7 That was one of the conditions on the use
8 of the narrow-based towers, they would not be used in
9 certain areas, and unstable soils were one of them, but
10 nobody really had a lot of experience with it and we
11 weren't able to define it much better than that. But
12 when you actually get into the construction we found
13 problems occurred.

14 So there was some cases where the tower
15 was in the middle of field and would qualify for a
16 narrow-based tower, based on the sub soil conditions
17 we weren't able to put those towers in.

18 Q. But getting back to Exhibit 434.125,
19 Interrogatory 7.29.22, it will be possible to do it but
20 it's a matter of cost?

21 A. Yes. Technically anything is
22 feasible. It really became a combination of
23 technically feasible and within reasonable cost.

24 Q. Okay. Now, would you please to turn
25 to Interrogatory 2.29.25, which is across the page at

1 page 8 in the interrogatory package, over the page.

2 That's already been assigned a number. Exhibit
3 433.127.

4 Now, in that interrogatory I asked for a
5 brief cost comparison between standard-based towers and
6 narrow-based towers. The response, which is dated
7 September 1991, was that a one circuit narrow-based
8 tower could be up to \$40,000 more than standard, while
9 a two circuit narrow-based tower could be up to \$78,000
10 more than standard.

11 As a point of clarification, could you
12 tell me whether these costs are for 500 kilovolt
13 towers?

14 A. It does not say whether they are or
15 not, but I assume they are because those numbers are
16 the numbers that were used in the relatively early
17 stages of our attempt to design narrow-based towers,
18 and they were predicted estimates, not having gone
19 through any actual experience with them. They were
20 used at one point in our studies in southwestern
21 Ontario.

22 So, I would say two things. I think they
23 are for 500 kV towers, but I also think that they are
24 somewhat dated in their accuracy, and the figure is
25 actually -- the actual figures that we have

1 subsequently found out, and based on our experience and
2 what we are using to estimate now are considerably less
3 than that.

4 Q. Okay. Going on to what is actually
5 used now, would those be the figures you gave in direct
6 evidence which I believe were 20,000 to 25,000--

7 A. Yes.

8 Q. --above the cost of a standard base?

9 A. What I can do, I can give you the
10 actual average figure roughly from the project engineer
11 that worked on Bruce to Longwood, he felt in the range
12 of 30- to \$40,000.

13 Now, the numbers that I gave, I have to
14 qualify, the unit costs that I gave did not include
15 interest contingencies or overhead. That's the actual
16 costs of going out and when you run through an entire
17 life of a project and the other charges that get
18 applied, those could be around 50 per cent in addition
19 to the unit costs I gave. So, if you took my figures
20 and bumped them up by about 50 per cent, the unit cost
21 figures I was given, that would again get you in the
22 30- to 40,000 range.

23 Q. And then when you are considering a
24 cost against whether or not to install a narrow-based
25 tower, you would be considering the 30- to \$40,000, not

1 the 20- to 25,000?

2 A. Yes. I believe they looked at what
3 was the average cost to install them. And when you got
4 into the sandy moisture saturated soils, that they were
5 going significantly passed that, and that's when the
6 decision was made not to install them above a certain
7 cost.

8 Q. I see. And the figures you are
9 quoting me, the 30- to 40,000, that's based on the
10 actual experience on the Bruce to Longwood --

11 A. That is his sort of ballpark estimate
12 without having gone through it at all.

13 About half the towers on that line were
14 narrow-based towers.

15 Q. Which line?

16 A. Bruce to Longwood.

17 So about half the towers in the line
18 ended up being narrow-based. So not all towers,
19 obviously as I have indicated, are narrow based.

20 Q. I am wondering whether you could
21 check that figure overnight. This is where I would be
22 moving to, Exhibit 434.74, which was interrogatory
23 response 7.10.182.

24 A. 7.10.182?

25 Q. Yes. There are four pages and that

1 would be the last page of that interrogatory. About
2 halfway down the page, it reads: Bruce to Longwood,
3 265 marrow-based towers were installed on that section
4 of the line; is that correct?

5 A. I'm sorry, I am not on the page yet.

6 It's the last page?

7 Q. The last page.

8 A. Sorry, which page?

9 Q. The exhibit is 434.74 and the
10 interrogatory is No. 7.10.182.

11 A. Yes, I have that. So, that's the
12 Annual Compliance Report?

13 Q. Yes.

14 A. I am having trouble looking at...

15 Okay.

16 Q. The copy I have is four pages.
17 Halfway down the last page under the underlined heading
18 Bruce to Longwood it reads: 265 narrow-based towers
19 were installed on this section of the line.

20 A. I don't think you have got the
21 entire...

22 What term and condition number was it?
23 Does it have that?

24 Q. It says at the head of it, Term and
25 Condition 16.

1 A. Okay. Yes, 265. Yes, 265 and I said
2 700. I said approximately half the towers. That was
3 the information I got from the project engineer.

4 Q. 265 is less than half of 700.

5 A. Yes. I think 700 may have been a
6 little bit over. Yes, okay, I agree, that's under
7 half.

8 Q. The reason I am questioning this is
9 that I used an interrogatory, 7.10.33, which included
10 as part of the attachments a report entitled "As
11 Constructed Specification for the Double Circuit 500 kV
12 Transmission Line, Bruce NDP by Longwood TS." Are you
13 familiar with that report?

14 A. Yes, I know it appears on one of the
15 interrogatories.

16 [5:00 p.m.]

17 Q. Okay. Appendix D of that report was
18 entitled, "Tower Line Data". And I gather that what
19 that did was list each tower on the line and give a
20 certain amount of information about the tower,
21 including whether or not it was a narrow-based tower;
22 is that correct? Are you familiar with that?

23 A. I haven't got that form of it, yes,
24 but that would have been done in the initial phase of
25 the planning for the line. That would have been based

1 on its location vis-a-vis the cultivated agricultural
2 land and that sort of thing.

3 Q. This says "as constructed".

4 Was this done before --

5 A. I am sorry, I am sorry, I am sorry.
6 I thought it was the right-of-ways' specs.

7 Q. Sorry. If you would like to go to --

8 THE CHAIRMAN: I am not sure where all
9 this is leading us to. Roughly somewhere around half
10 the towers were narrow-based and maybe more, maybe
11 less.

12 MR. BANCROFT-WILSON: A little under
13 perhaps.

14 MRS. MACKESY: I will explain, Mr.
15 Chairman.

16 Actually, the figure that I worked out
17 from this interrogatory was about 37 or 38 per cent -
18 about 38 per cent, I believe; would that be correct?

19 THE CHAIRMAN: Well, it might, but I
20 don't think it makes much difference as far as we are
21 concerned.

22 MRS. MACKESY: Okay.

23 MR. BANCROFT-WILSON: Half the suspension
24 towers -- that perhaps is another thing. It should
25 have put in there, I think, in qualifying, so it is

1 where, you know, they were straight through. That may
2 have been his number, but anyway, I don't know if it is
3 really that relevant right here.

4 MRS. MACKESY: Okay. Well, perhaps we
5 could stop now, Mr. Chairman, and I will come back
6 tomorrow.

7 THE CHAIRMAN: All right. We will
8 adjourn now until ten o'clock tomorrow morning.

9 THE REGISTRAR: This hearing will adjourn
10 until ten o'clock tomorrow morning.

11 ---Whereupon the hearing was adjourned at 5:03 p.m., to
12 be reconvened on Thursday, the 23rd day of January,
1992, at 10:00 a.m.

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E R R A T A
and
C H A N G E S

To: Volume 104

Date: Tuesday, January 21, 1992.

<u>Page No.</u>	<u>Line No.</u>	<u>Discrepancy</u>
(v)		Interrogatory No. 434.113 s/r <u>Interrogatory No. 7.9.4.</u>
18355	1	Interrogatory No. 434.113 s/r <u>Interrogatory No. 7.9.4.</u>

